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FISH AND WILDLIFE INVENTORY OF THE SEVEN-COUNTY REGION

Archbold Biological Station
Contract No. 14-16-0009-77-005

Volume II, pages 644-1279
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FISH AND WILDLIFE INVENTORY OF THE SEVEN-COUNTY REGION INCLUDED IN THE CENTRAL FLORIDA PHOSPHATE INDUSTRY AREAWIDE ENVIRONMENTAL IMPACT STUDY

Volume II, pages 644 - 1279

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FISH AND WILDLIFE SERVICE

U. S. Department of the Interior

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September 1977

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BLACK-BELLIED WHISTLING-DUCK *Dendrocygna autumnalis* (Linnaeus)

Order Anseriformes Family Anatidae

Other Names: Black-bellied Tree-Duck

Distribution: This species is an extremely rare visitor to Florida, having been seen only four times in the state in different years, with only two sightings in the seven-county area. A flock of five was seen in a phosphate pit near Bartow, Polk County, on 9 September 1976 (Edscorn 1977); four individuals of this species were observed and photographed at Venice, Sarasota County, on and after 17 June 1977 (J. B. Edscorn pers. comm.). The possibility exists that these records represent escaped captives. However, this species has been reported increasing its range in Texas and some wild birds may come into Florida in company with Fulvous Whistling-ducks (J. B. Edscorn pers. comm.). The Black-bellied Whistling-duck, which is found in much the same habitat as the Fulvous Whistling-duck, though more in wooded areas, breeds mainly in Mexico and Central America.

Selected References:

*Edscorn, J. B. 1977. Florida region. Am. Birds 50(2):166-169.

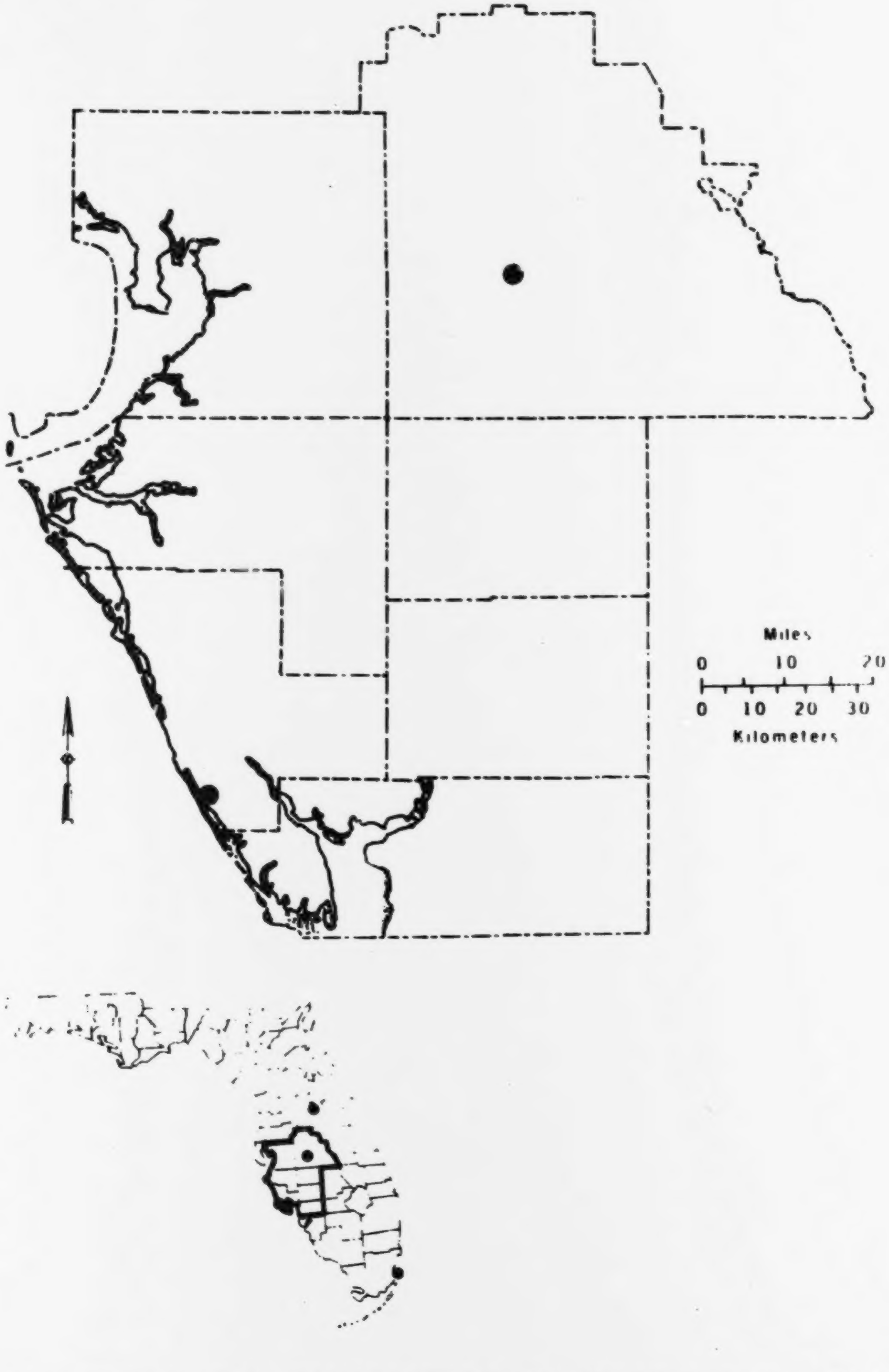
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Fig. VIII.D.35. BLACK-BELLIED WHISTLING-DUCK (Dendrocygna autumnalis)

Listed - Blue List

Game

FULVOUS WHISTLING-DUCK   *Dendrocygna bicolor* (Vieillot)

Order Anseriformes   Family Anatidae

Other Names: Fulvous Tree-duck

Distribution: The Fulvous Whistling-duck is known, chiefly as a transient and winter visitor, from all counties in the seven-county area except DeSoto and Hardee. It occurs throughout peninsular Florida in irregular numbers and has nested locally in south Florida. It occurs most frequently from September to May and rarely in summer. In North America the species breeds from central California, southeastern Texas, and southern Arkansas southward to southern Mexico.

Habitat: The Fulvous Whistling-duck frequents a variety of habitats from freshwater marshes and lakes to oak forests and croplands (Kortright 1943). It prefers to build its nest in the grasses on the edges of ponds or swamps. The few sightings of this species in the seven-county area have been from lakes, ponds, rivers, estuaries and sewage settling basins (Woolfenden 1973).

Population Status: Though generally rare, this duck is an irregular visitor to the study area, and thus quantitative statements on population status are difficult. While some observers from the seven-county area report only single individuals or pairs, others have recorded groups. Such records include 30 at Myakka River State Park (K. C. Alvarez pers. comm.), 20 at Lake Juliana, Polk County (Edscorn 1975), and 12 flying over Cape Haze, Charlotte County (Hewitt 1976). However, the species apparently is increasing locally in Florida, with a high count of 2500 seen at Loxahatchee

National Wildlife Refuge in December and January 1972-73 (Woolfenden 1973), and the possibility of its breeding here should not be overlooked.

Basis for Priority Status: This species is on the 1977 Blue List of the National Audubon Society because of an apparent sudden decline noted in parts of its range in 1975. The Fulvous Whistling-duck is also a game species. It is assigned a point value of 100 in the 1976-1977 Florida Game and Fresh Water Fish Commission hunting regulations. It ranks next to last in the 1961-1970 average annual water-fowl harvest from the seven-county area, with the entire take (11) from Polk County (Carney *et al.* 1975).

Potential Impacts of Mining: Disturbance of natural wetlands by mining activities would decrease the potential of this species becoming regular in the seven-county area.

Selected References:

*Carney, S. M., M. F. Sorensen, and E. M. Martin. 1975. Distribution in states and counties of waterfowl species harvested during 1961-70 hunting seasons. U. S. Fish and Wildl. Serv. Spec. Sci. Rept. - Wildl. No. 187. 132 pp.

*Edscorn, J. B. 1975. Avian highlights of the year. Lake Region Nat., Fall-Winter 1974-1975, p. 14.

*Hewitt, O. H. 1976. Fieldbook of birds of the Florida suncoast. Mote Marine Lab., Sarasota, Florida. 150 pp.

*Kortright, F. H. 1943. The ducks, geese and swans of North America. The American Wildl. Inst., Washington. 476 pp.

*Woolfenden, G. E. 1973. Florida region. Am. Birds 27(3):603-607.

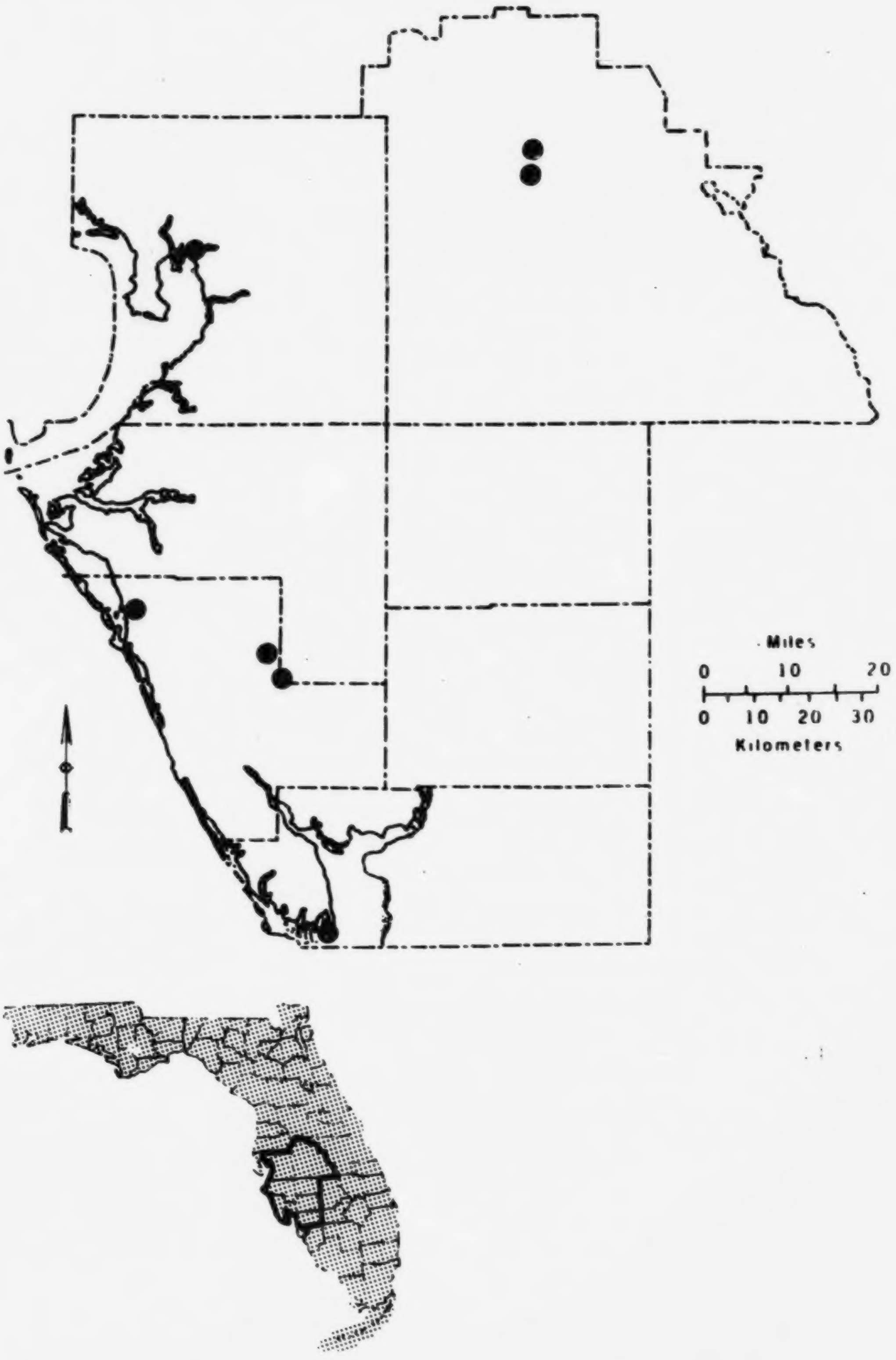
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Fig. VIII.D.36. FULVOUS WHISTLING-DUCK (*Dendrocygna bicolor*)

Game

MALLARD *Anas platyrhynchos* Linnaeus

Order Anseriformes Family Anatidae

Distribution: The Mallard is a winter resident in the seven-county area, with records existing for all but Hardee County. The panhandle is the major region of the Mallard's distribution in Florida, but the species is seen throughout the peninsula. It is rare in extreme southern peninsular Florida and absent from the Keys. It breeds in northern and central North America, and winters regularly from October to June in Florida.

Habitat: The Mallard prefers large shallow bodies of fresh water, records existing from lakes, marshes, ponds, rivers, and artificial freshwater impoundments, such as phosphate slime ponds, within the seven-county area. Records of estuarine habitats include coastal salt marsh and McKay Bay.

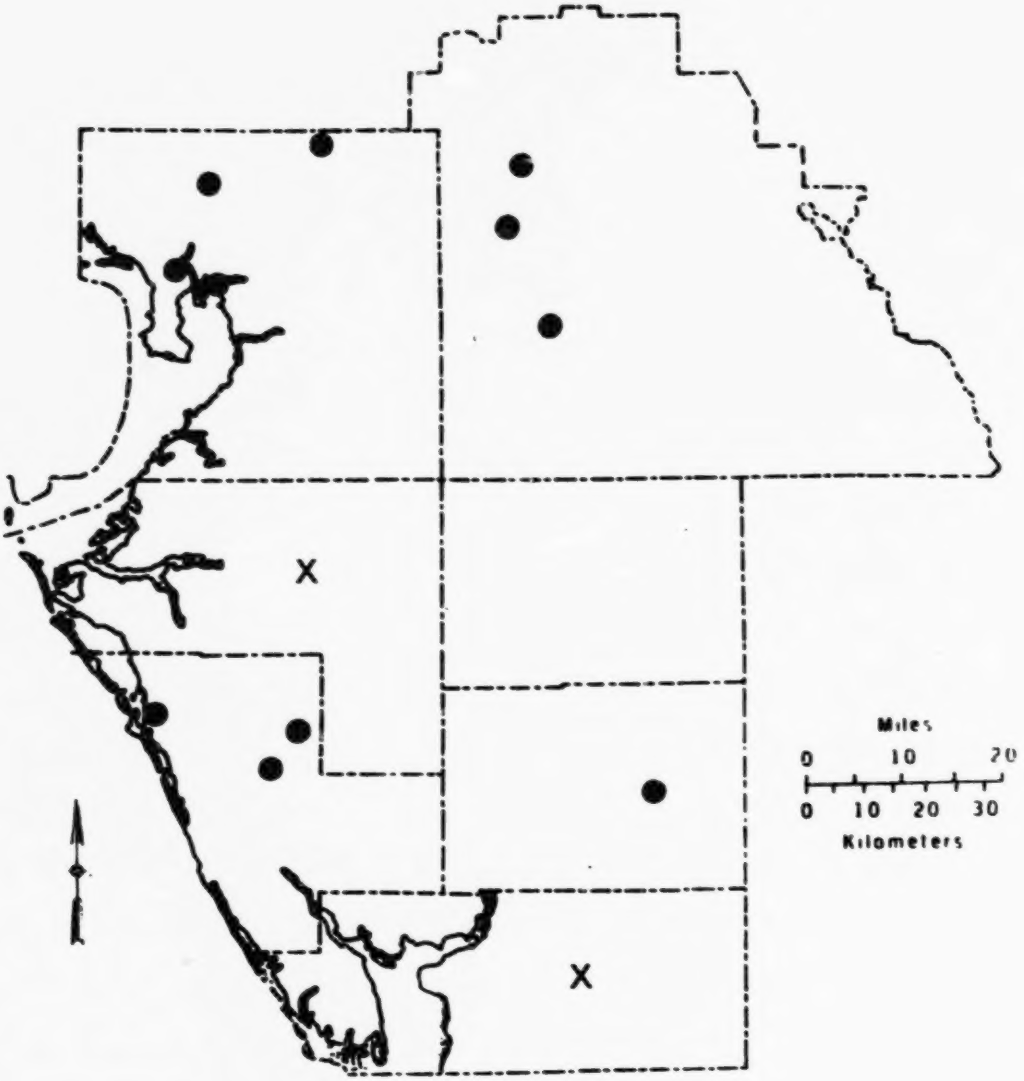
Population Status: The Mallard is a rare winter resident in the seven-county area, though domestic forms are more common locally in parklands and various other habitats with natural or artificial freshwater impoundments. With the exception of the Bradenton count, Christmas Bird Counts in the area report few or no Mallards. It is likely that most or all of the Mallards seen on the Bradenton counts are domestic or feral and they are excluded from this analysis. The largest number (34) reported from the seven-county area was on the Myakka River State Park 1975-76 Christmas Bird Count. The species has been reported in slightly fewer numbers on the Tampa and Lakeland counts, but it is an extremely infrequent and rare find on the Sarasota and Venice counts.

Basis for Priority Status: The Mallard is abundant and widespread through much of North America, and it is easily introduced elsewhere. For these and other reasons, such as large size and palatability, the Mallard is ranked first among game waterfowl. This species is assigned a point value of 25 for drakes and 70 for hens in the 1976-1977 state hunting regulations. Within the seven-county area, the Mallard ranks thirteenth in average annual harvest (127), with half (65) of the total number taken by Polk County hunters, and the other half essentially divided between Manatee (28) and Hillsborough (25) counties (Carney _et al_. 1975).

Potential Impacts of Mining: Although reduction of natural wetlands by mining could have a potential negative effect on this species, the impact would probably be minor considering the uncommon status of wild individuals in the region. However, the Mallard, like many other species of waterfowl, does use shallow slime ponds for foraging and an increase of such aquatic habitats might favor the species.

Selected References:

*Carney, S. M., M. F. Sorensen, and E. M. Martin. 1975. Distribution in states and counties of waterfowl species harvested during 1961-70 hunting seasons. U. S. Fish and Wildl. Serv. Spec. Sci. Rept. - Wildl. No. 187. 132 pp.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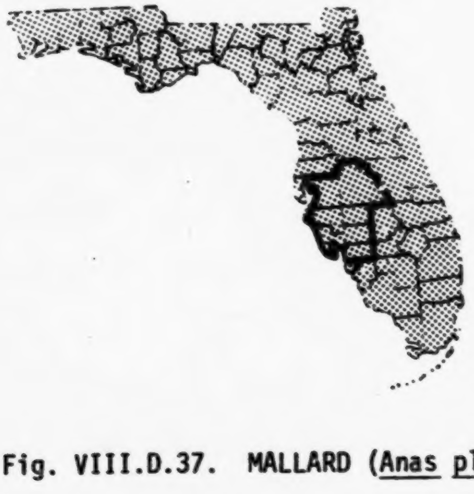

Fig. VIII.D.37. MALLARD (*Anas platyrhynchos*)

Game

BLACK DUCK *Anas rubripes* Brewster

Order Anseriformes Family Anatidae

Distribution: The Black Duck is a winter resident in the seven-county area, as has been recorded from every county but DeSoto and Hardee. Its distribution in Florida is very similar to that of the Mallard in that the species is more common in the panhandle than in peninsular Florida. Christmas Bird Counts at Coot Bay on the southwestern tip of the peninsula show no Black Duck records from 1957-1971, and other counts throughout the peninsula show only a trace (<0.5 per 10 party hours) for the same time period. The species breeds in northeastern North America and winters in Florida from October to May.

Habitat: The Black Duck feeds more extensively than the Mallard in salt marshes and other coastal habitats. Records of Black Ducks in the seven-county area exist from waters in mangrove swamps and near beaches (Charlotte County) and estuaries (Cockroach and McKay bays, Hillsborough County) as well as lakes and rivers (Myakka River State Park). Like the Mallard, it prefers shallow water.

Population Status: The Black Duck is a rare winter resident in the seven-county area. When seen, at irregular intervals, it is usually counted in numbers less than ten. The 1946-47 and 1948-49 Christmas Bird Counts at Myakka River State Park report questionable numbers of 167 and 160, respectively, but it has been reported on only five counts at Myakka River State Park since then, in numbers ranging from 2 to 11.

Basis for Priority Status: The Black Duck is a game species, with an assigned point value of 70 in the state 1976-1977 hunting regulations. It ranks fourteenth in average annual harvest (84) within the seven-county area, with more than half (46) of the individuals taken in Hillsborough County (Carney _et_ _al_. 1975).

Potential Impacts of Mining: Because of the Black Duck's habitat preferences, mining of inland wetlands probably will not affect this species as much as some of the other waterfowl. However, inland wetlands do provide important resting refuges for all migrating waterfowl, and, hence, elimination of these areas could affect the habits and status of the Black Duck in the seven-county area. Slime ponds could serve as potential habitat, but their significance in this regard is questionable.

Selected References:

*Carney, S. M., M. F. Sorensen, and E. M. Martin. 1975. Distribution in states and counties of waterfowl species harvested during 1961-70 hunting seasons. U. S. Fish and Wildl. Serv. Spec. Sci. Rept. - Wildl. No. 187. 132 pp.

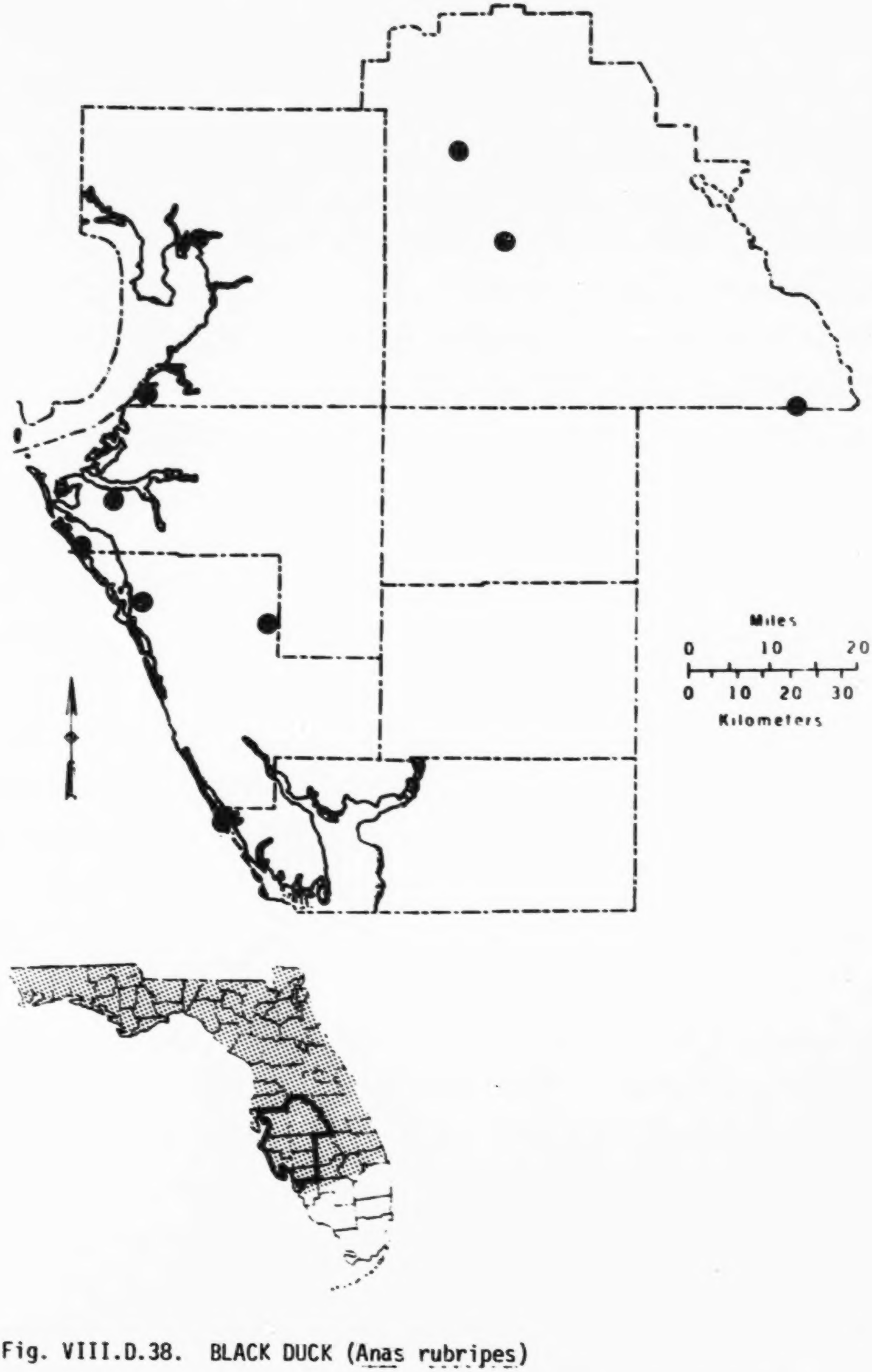
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Fig. VIII.D.38. BLACK DUCK (Anas rubripes)

Game

MOTTLED DUCK Anas fulvigula Ridgway

Order Anseriformes Family Anatidae

Other Names: Florida Duck

Distribution: The Mottled Duck is a permanent resident and breeder in all seven counties of the study area. On the Florida peninsula its range extends from the Chassahowitska River and Alachua and Seminole counties southward to Florida Bay.

Habitat: The Mottled Duck is found in a variety of habitats, but it favors shallow water areas such as sloughs, small potholes, drainage ditches, and seasonally flooded wet prairies, with mud or muck bottoms and relatively dense vegetation (Lotter 1969). Aside from these habitat types, the Mottled Duck in the seven-county area has been recorded from lakes, rivers, pine flatwoods, mesic hammocks, and mangrove and mixed hardwood swamps. Phosphate slime ponds are also a highly preferred habitat and the species uses spoil islands and phosphate-mined lands for nesting (F. Montalbano pers. comm.). These records suggest that the species is almost exclusively a fresh water inhabitant. Christmas Bird Counts and Breeding Bird Surveys in the area support this statement, with greatest numbers in Myakka River State Park and Manatee and Hardee counties (Tables VIII.D.5, 7).

A five-year inventory by Evans (unpubl. MS) showed that, of four habitat-types where Mottled Ducks were found, the species preferred lake marsh and mangrove edge to flatwoods and low marl hammock in both spring (breeding grounds census) and fall (pre-hunting season inventory).

Population Status: This Florida breeder is a common but local resident of the state. The total population was estimated by Chamberlain (1960) to be from 5000 to 30,000 individuals. The species is usually seen in groups of fewer than five. Evans' (unpubl. MS) pre-hunting season inventory (1956-1960) estimated average densities of 10, 8, 6, and 2 birds per square mile for mangrove edge, lake marsh, low marl hammock, and flatwoods, respectively, in an area just south of and including Charlotte County.

Basis for Priority Status: The Mottled Duck is a game species, with a point value of 70 in the 1976-1977 state hunting regulations. It ranks second only to the Ring-necked Duck in terms of average annual harvest (2527), with from 86 to 1475 harvested in all counties except Hardee. Polk County hunters accounted for 59 percent (1475) of the kill while Charlotte County took 19 percent (491), with Hillsborough (342), Sarasota (101), DeSoto (86), and Manatee (32) counties making up the rest (Carney et al. 1975).

Potential Impacts of Mining: Elimination of natural wetlands by mining can be expected to reduce both the foraging and breeding areas of the Mottled Duck. However, as noted above, certain reclamation practices can restore suitable habitat for this important breeding waterfowl species. Slime ponds at the proper stage of succession can provide good habitat during active mining and on mined, unreclaimed land.

Selected References:

*Carney, S. M., M. F. Sorensen, and E. M. Martin. 1975. Distribution in states and counties of waterfowl species harvested during 1961-70 hunting seasons. U. S. Fish and Wildl. Serv. Spec. Sci. Rept. - Wildl. No. 187. 132 pp.

*Chamberlain, E. B., Jr. 1960. Florida waterfowl populations, habitats, and management. Fla. Game and Fresh Water Fish Comm. Tech. Bull. No. 7. Contri. P.R. Proj. W-19-4. 62 pp.

*Evans, J. Florida Duck inventories. Fla. Game and Fresh Water Fish Comm. Job II-B: W-19-R-13. Unpubl. MS.

*Lotter, C. F. 1969. Habitat requirements and procedures for measuring various population parameters of the Florida duck. M.S. Thesis, Univ. of Fla. 153 pp.

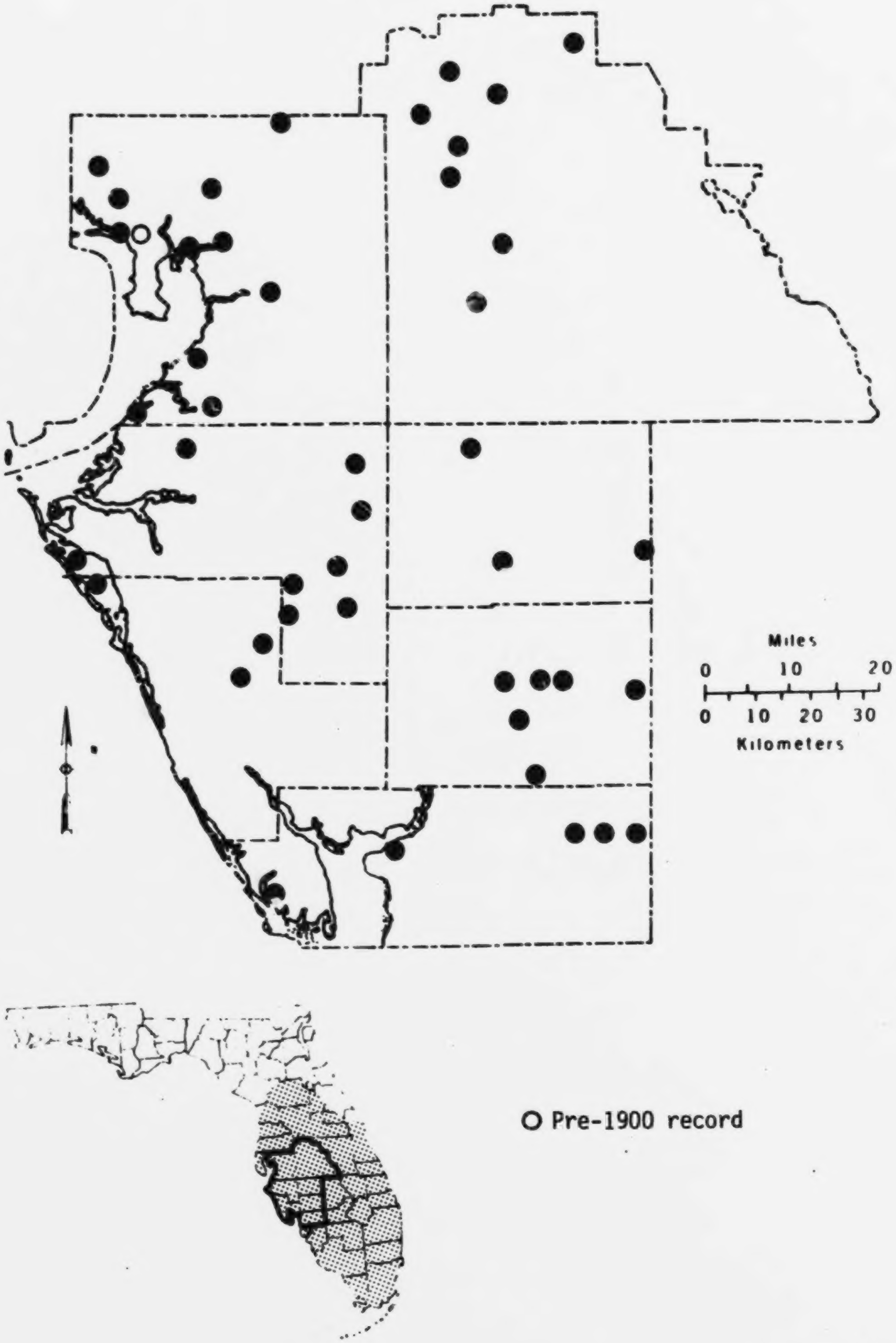
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Fig. VIII.D.39. MOTTLED DUCK (*Anas fulvigula*)

Game

GADWALL *Anas strepera* Linnaeus

Order Anseriformes Family Anatidae

Distribution: The Gadwall is reported to be a winter resident in five of the seven counties, with apparently no records existing for DeSoto and Hardee counties. Howell (1932) noted that the species was unrecorded south of Cape Canaveral; Sprunt (1954) reported Lake Okeechobee and the ponds of the Kissimmee Prairie as the southern limit of its range. More recently the species has been recorded, although infrequently and in low numbers, at Coot Bay in extreme southwestern Florida. The major portion of the Gadwall's distribution in Florida is still in the panhandle (Woolfenden and Schreiber 1973). The Gadwall breeds in northwestern North America and winters in Florida from October to May, with an occasional summer record.

Habitat: Within the seven-county area the Gadwall has been reported from small lakes and ponds (near Lakeland), freshwater marshes and rivers (Myakka River State Park), and estuaries (McKay Bay). It is absent from other coastal areas, but sometimes it occurs in slime ponds in phosphate mining areas (Fla. Game and Fresh Water Fish Comm. unpubl. MS).

Population Status: The Gadwall is a regular but rare species in regions of suitable habitat within the seven-county area. Fewer than 1 bird per 10 party hours are reported for Lakeland Christmas Bird Counts, 1974-1976, and fewer than 0.5 per 10 party hour for the Tampa count over the same 3-year time period. Small flocks of 2 to 35 Gadwalls have been seen regularly on the last seven Lakeland Christmas Bird Counts. Flocks of 1 to 9 have been seen regularly on the seven Tampa counts, and a flock of 21 was seen on 20

December 1976 in Myakka River State Park, where the species is recorded only occasionally (K. C. Alvarez pers. comm.).

Basis for Priority Status: The Gadwall is a game species, with a point value of 10 in the 1976-1977 state hunting regulations. Of 22 duck species the Gadwall ranks twelfth in average annual harvest (214) with the greatest number being taken in Polk (95), Hillsborough (63), and Charlotte (47) counties (Carney et al. 1975).

Potential Impacts of Mining: As with other waterfowl, elimination of natural wetlands by mining and certain types of reclamation will reduce the availability of suitable habitat for this species. This loss may, at least partly, be compensated for by slime ponds which may be suitable habitat. More information is needed on this point.

Selected References:

*Carney, S. M., M. F. Sorensen, and E. M. Martin. 1975. Distribution in states and counties of waterfowl species harvested during 1961-70 hunting seasons. U. S. Fish and Wildl. Serv. Spec. Sci. Rept. - Wildl. No. 187. 132 pp.

*Florida Game and Fresh Water Fish Commission. An evaluation of waterfowl habitat on phosphate mine lands. Unpubl. MS. 7 pp.

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

*Sprunt, A., Jr. 1954. Florida bird life. Coward-McCann, Inc., New York. 527 pp.

*Woolfenden, G. E., and R. W. Schreiber. 1973. The common birds of the saline habitats of the eastern Gulf of Mexico: their distribution seasonal status, and feeding ecology, Pages IIIJ-1 - IIIJ-21 *in* A summary of knowledge of the eastern Gulf of Mexico 1973. State Univ. System of Fla. Inst. of Oceanography, St. Petersburg, Florida.

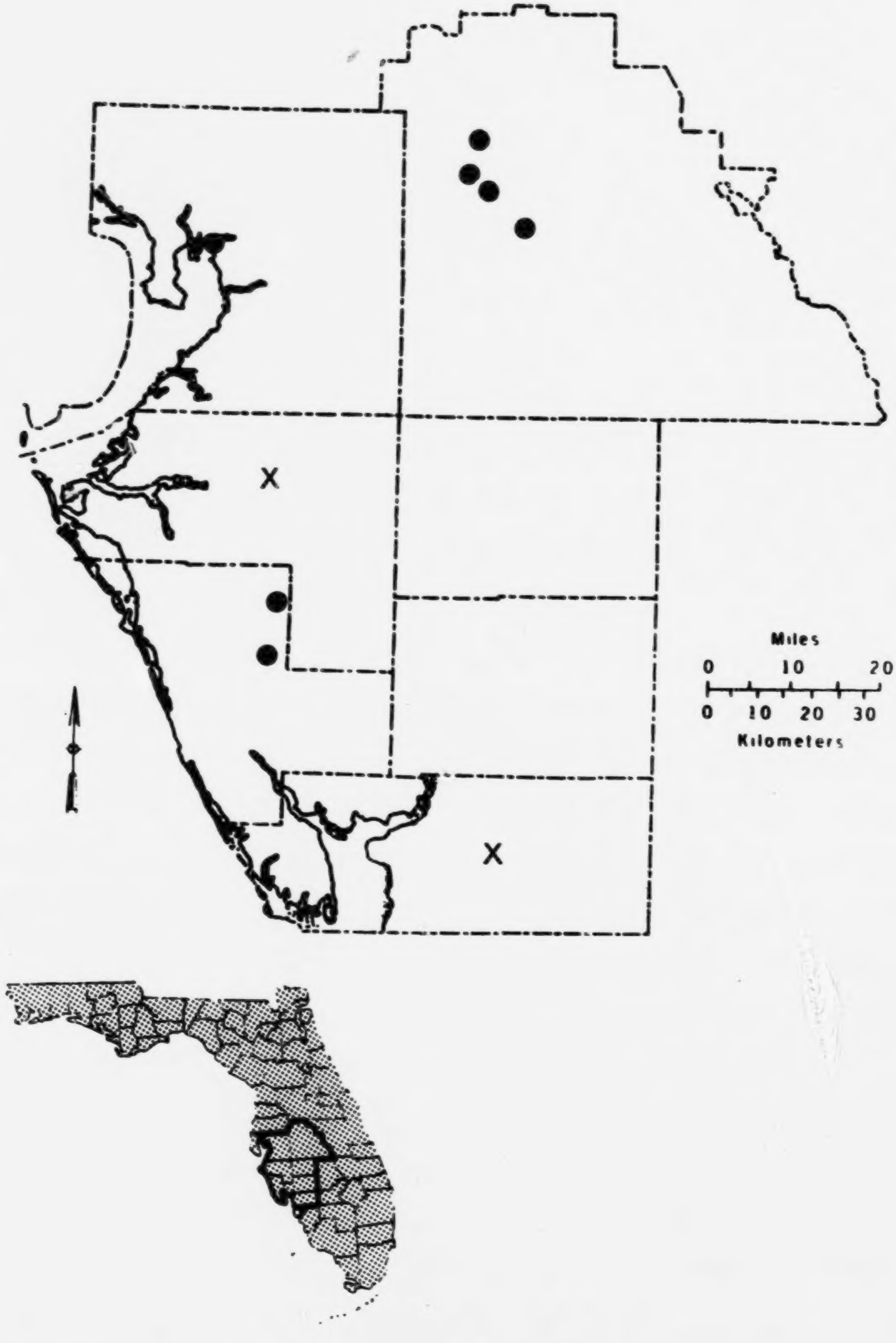
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Fig. VIII.D.40. GADWALL (*Anas strepera*)

Game

PINTAIL

Anas acuta Linnaeus

Order Anseriformes

Family Anatidae

Distribution: The Pintail is a winter resident in the seven-county area, recorded in every county except Hardee. Although Howell (1932) reported the species to be less numerous in the southern than in the northern half of the state, the Pintail is seen regularly in greater numbers on the Coot Bay Christmas Bird Count, at the southwestern edge of the peninsula, than in other parts of the peninsula and panhandle where it is also a regular winter resident. Very few individuals of the species, however, are seen in the Keys. The Pintail arrives in Florida in September and departs in April for its breeding grounds, which extend over much of North America.

Habitat: The Pintail is almost exclusively an inland inhabitant of marshes and shallow ponds and lakes. An exception within the seven-county area is the sheltered estuarine environment of McKay Bay, which is second to Myakka River State Park in terms of Pintail abundance. Other coastal regions report few (Bradenton, Manatee County) or none (Sarasota and Venice, Sarasota County) of this species (Table VIII.D.5).

Population Status: The Pintail is uncommon throughout the seven-county area. Although seen fairly regularly in Myakka River State Park, the species apparently is less common now than in previous decades (Baynard 1942). The greatest single concentration of the species within the seven counties was at McKay Bay when 1200 were seen on the 1971-72 Christmas Bird Count. However, flocks numbering 100 birds or less are more the norm for both the Tampa and Myakka River State Park Christmas Bird Counts.

Basis for Priority Status: The Pintail is a game species, with a point value of 10 in the 1976-1977 state hunting regulations. It ranks seventh in average annual harvest (742), with Hillsborough County (419) taking over one-half and Charlotte County (218) over one-fourth of the total Pintail successfully hunted in the seven-county area (Carney et al. 1975)

Potential Impacts of Mining: Elimination of natural inland wetlands by mining will reduce the availability of suitable habitat for this species. The typical deep, steep-sided artificial lakes and ponds typically formed in reclamation would, at most, provide suboptimum habitat. With proper management, slime ponds would provide potential habitat.

Selected References:

*Baynard, O. E. 1942. A check-list of birds Myakka River State Park. Fla. Forest and Park Serv., Sarasota, Florida. 15 pp.

*Carney, S. M., M. F. Sorensen, and E. M. Martin. 1975. Distribution in states and counties of waterfowl species harvested during 1961-70 hunting seasons. U. S. Fish and Wildl. Serv. Spec. Sci. Rept. - Wildl. No. 187. 132 pp.

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

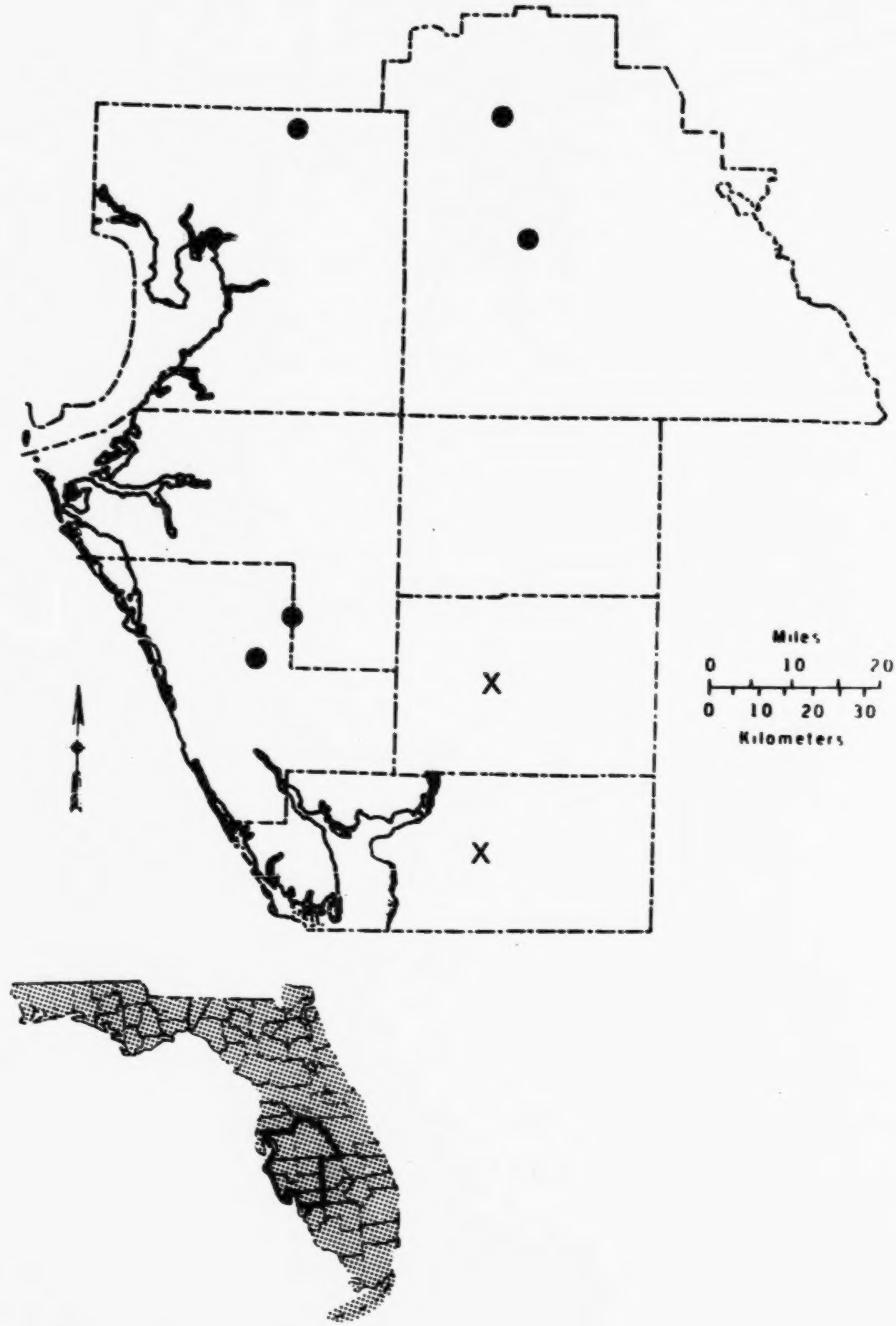
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Fig. VIII.D.41. PINTAIL (*Anas acuta*)

Game

GREEN-WINGED TEAL *Anas crecca* Linnaeus

Order Anseriformes Family Anatidae

Distribution: The Green-winged Teal is a winter resident in the seven-county area, with records existing for all but Hardee County. Howell (1932) considered the species to be rare in southern Florida, but the Coot Bay Christmas Bird Count near the extreme southwestern tip of the mainland records the species in high numbers (Woolfenden and Schreiber 1973). The current status is regular in winter throughout mainland Florida, arriving in numbers in October and departing in March for the breeding range in northwestern North America. One record of the Eurasian subspecies exists for the area; it was seen at Myakka River State Park on 30 January 1969 (Preston 1969).

Habitat: The Green-winged Teal prefers the aquatic vegetation of shallow water. Within the seven-county area, it has been recorded most often from the marshy edges of lakes, ponds, and rivers, with additional records from the estuarine habitats of Hillsborough County such as McKay Bay and brackish sloughs near southeastern Tampa Bay. Artificial freshwater impoundments, such as phosphate slime ponds, are also prime foraging areas. Table VIII.D.5 illustrates these habitat preferences, with the species found exclusively on the Tampa (McKay Bay), Lakeland (lakes and slime ponds), and Myakka River State Park (lakes, sloughs, and river) Christmas Bird Counts.

Population Status: In its preferred habitat, the Green-winged Teal is an uncommon winter resident, but elsewhere it is rare. Present-day preferred sites include McKay Bay, with 400 recorded on 1 January 1977

(G. E. Woolfenden pers. comm.), and Lakeland, with 241 reported on the 1976-77 Christmas Bird Count. The habitat of the latter site consists primarily of slime ponds. The species has decreased at Myakka River State Park in recent decades (Baynard 1942). High counts are on record for winter 1952-63 and 1964-65 when 700 individuals were counted. Less than 200 have been listed for the same area in the years since then. Although reasons for this decline are not given, local habitat changes as opposed to long-term population trends seem likely because of the absence of trends noted for the entire study area.

Basis for Priority Status: The Green-winged Teal is a game species, with a point value of 10 in the 1976-1977 state hunting regulations. It ranks fifth in the seven-county area in terms of average annual harvest (1261), being taken in greatest numbers in Hillsborough County (671), followed by Polk (398), Charlotte (132), and Manatee (60) counties (Carney *et al*. 1975).

Potential Impacts of Mining: Although mining activities would reduce natural habitats of this species in the seven-county area, the species might increase as a result of mining. Slime ponds obviously provide favorable habitats for Green-winged Teal. However, the lifetime of the shallow marshy habitats preferred by Green-winged Teal on these slime ponds is short and sporadic, as water levels are often controlled according to the water needs of the entire mining operation. In addition, these ponds develop emergent vegetation which further shortens the useful life of such ponds as waterfowl habitat. However, the unsatisfactory conditions in slime ponds produced by succession could be remedied by proper water level regulation and other management.

Selected References:

*Baynard, O. E. 1942. A check-list of birds Myakka River State Park. Fla. Forest and Park Serv., Sarasota, Florida. 15 pp.

*Carney, S. M., M. F. Sorensen, and E. M. Martin. 1975. Distribution in states and counties of waterfowl species harvested during 1961-70 hunting seasons. U. S. Fish and Wildl. Serv. Spec. Sci. Rept. - Wildl. No. 187. 132 pp.

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

*Preston, C. P. 1969. Sight record of the Common Teal Anas crecca. Fla. Nat. 42(3):134.

*Woolfenden, G. E., and R. W. Schreiber. 1973. The common birds of the saline habitats of the eastern Gulf of Mexico: their distribution, seasonal status, and feeding ecology , Pages IIIJ-1 - IIIJ-21 in A summary of knowledge of the eastern Gulf of Mexico 1973. State Univ. System of Fla. Inst. of Oceanography, St. Petersburg, Florida.

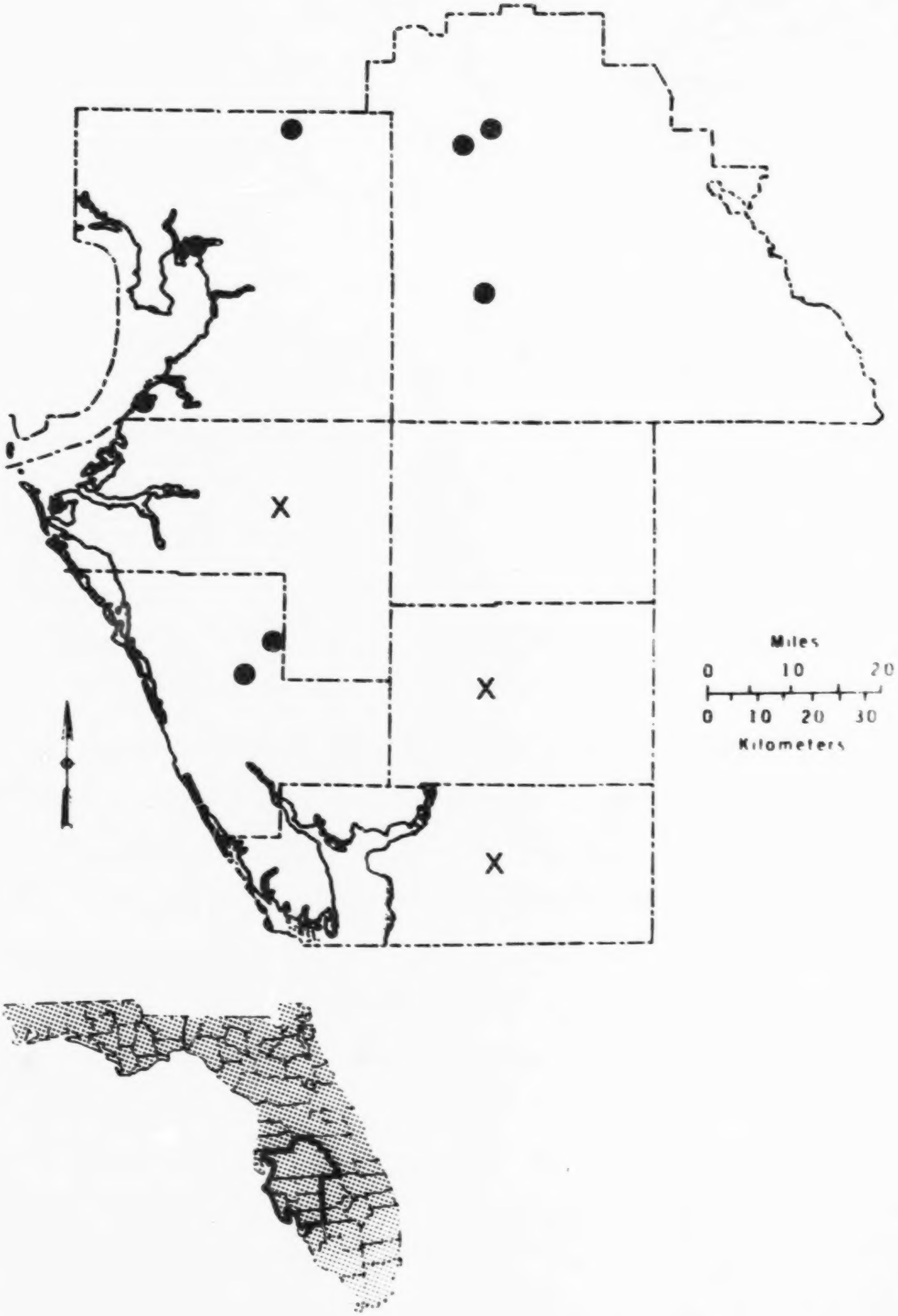
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Fig. VIII.D.42. GREEN-WINGED TEAL (*Anas crecca*)

Game

BLUE-WINGED TEAL *Anas discors* Linnaeus

Order Anseriformes Family Anatidae

Distribution: The Blue-winged Teal is a winter resident and transient, common in all seven counties and throughout the state in areas with suitable habitat. The species may be found regularly in Florida from August to June, and occasionally in the summer months, but breeds farther north on the continent.

Habitat: Like the Green-winged Teal, the Blue-winged Teal frequents inland marshes and other shallow bodies of water. It is recorded most often on pasture and prairie ponds and is one of the most abundant ducks on phosphate slime ponds. It also frequently occurs in shallow drainage ditches and canals. The species is uncommon along the coast, with the exception of the upper reaches of estuaries such as McKay Bay.

Population Status: The Blue-winged Teal is a common winter visitor, occurring locally in numbers as great as 1185, recorded on the Myakka River State Park 1974-75 Christmas Bird Count. Although the Blue-winged Teal has been recorded yearly, with two exceptions, on Christmas Bird Counts at Myakka River State Park since 1954-55, its numbers fluctuate greatly from one year to the next. For example, 164 were recorded on the 1973-74 count and 167 on the 1975-76 count, which are the counts that preceded and followed the 1974-75 count when the largest number yet (1185) was recorded. These yearly fluctuations in numbers occur throughout the seven-county area in no apparent pattern. McKay Bay, with Blue-winged Teal numbering as many as 295 on 1 January 1977 (G. E. Woolfenden pers. comm.), ranks second to Myakka

River State Park in abundance of this species in the seven-county area.

Basis for Priority Status: The Blue-winged Teal is a game species, with a point value of 10 in the 1976-1977 state hunting regulations. It ranks third in average annual harvest (2403) in the seven-county area, with over one-half of the total harvest for Polk County (1524) and over one-third from Hillsborough County (701) (Carney *et al*. 1975).

Potential Impacts of Mining: Slime ponds serve as important feeding areas for Blue-winged Teal. Fluctuations in numbers of this species on slime ponds correspond in part to density of cattails and other vegetation and changes in water level, as Blue-wings prefer about a 6-inch water level (F. Montalbano pers. comm.). As in the case of the Green-winged Teal, populations of this species in the seven-county area might increase as a result of mining as long as slime ponds remain in suitable condition. Artificial ponds and lakes of the type now created in reclamation would be generally unsuitable.

Selected References:

*Carney, S. M., M. F. Sorensen, and E. M. Martin. 1975. Distribution in states and counties of waterfowl species harvested during 1961-70 hunting seasons. U. S. Fish and Wildl. Serv. Spec. Sci. Rept. - Wildl. No. 187. 132 pp.

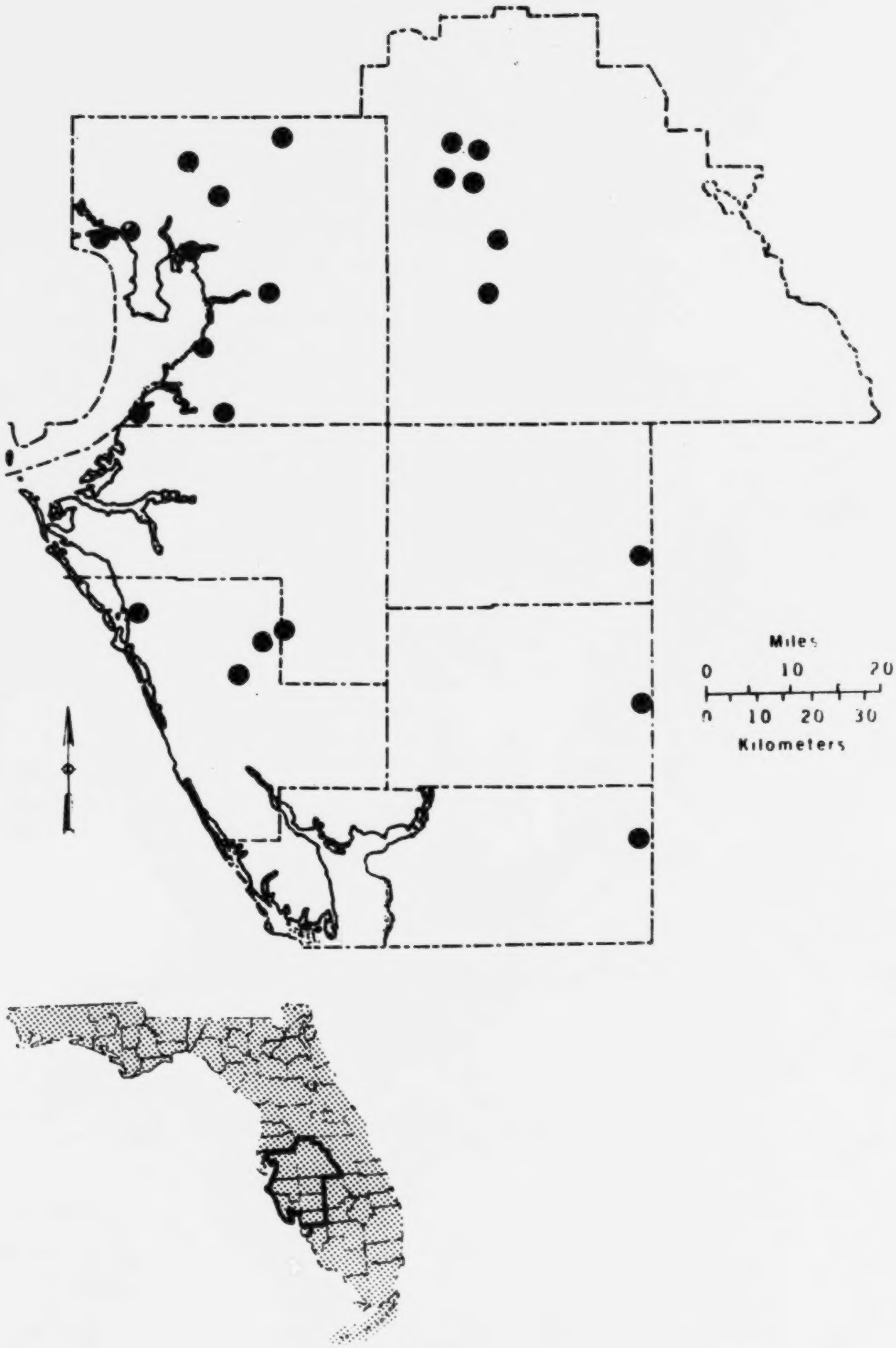
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Fig. VIII.D.43. BLUE-WINGED TEAL (*Anas discors*)

Game

CINNAMON TEAL *Anas cyanoptera* Vieillot

Order Anseriformes Family Anatidae

The Cinnamon Teal is rare throughout the entire state of Florida. Only one record exists for the seven-county area: Myakka River State Park, 3 February to 26 March 1976 (Edscorn 1976). Edscorn (unpubl. MS) includes the species on a hypothetical list for the Lake Region. Thus, the Florida population is inconsequential to the species as a whole, which breeds in western North America. Phosphate mining would have no adverse or beneficial impacts on the species.

Selected References:

*Edscorn, J. B. Birds of the Lake Region. Unpubl. MS.

*Edscorn, J. B. 1976. Florida birds. Fla. Nat. 49(3):24-25.

Game

EUROPEAN WIGEON Anas penelope (Linnaeus)

Order Anseriformes Family Anatidae

Distribution: The European Wigeon is rare throughout the state. Only two records exist for the seven-county area, both in Hillsborough County: Hillsborough Bay in 1955 (Stevenson 1956) and McKay Bay on the 1973-74 Tampa Christmas Bird Count. The species rarely winters near both coasts of North America from November to May. It breeds in northern parts of Europe and Asia, and is suspected of breeding in Canada (Stevenson 1976). The species is probably more common on this continent than is generally thought, but it is recorded only rarely because it is impossible to distinguish females of the two northern hemisphere wigeons. Phosphate mining activities will have no impact on its status in the seven-county area or elsewhere.

Selected References:

*Stevenson, H. M. 1956. Florida region. Aud. Field Notes 10(1):18-22.

*Stevenson, H. M. 1976. Vertebrates of Florida, identification and distribution. Univ. Presses of Fla., Gainesville. 607 pp.

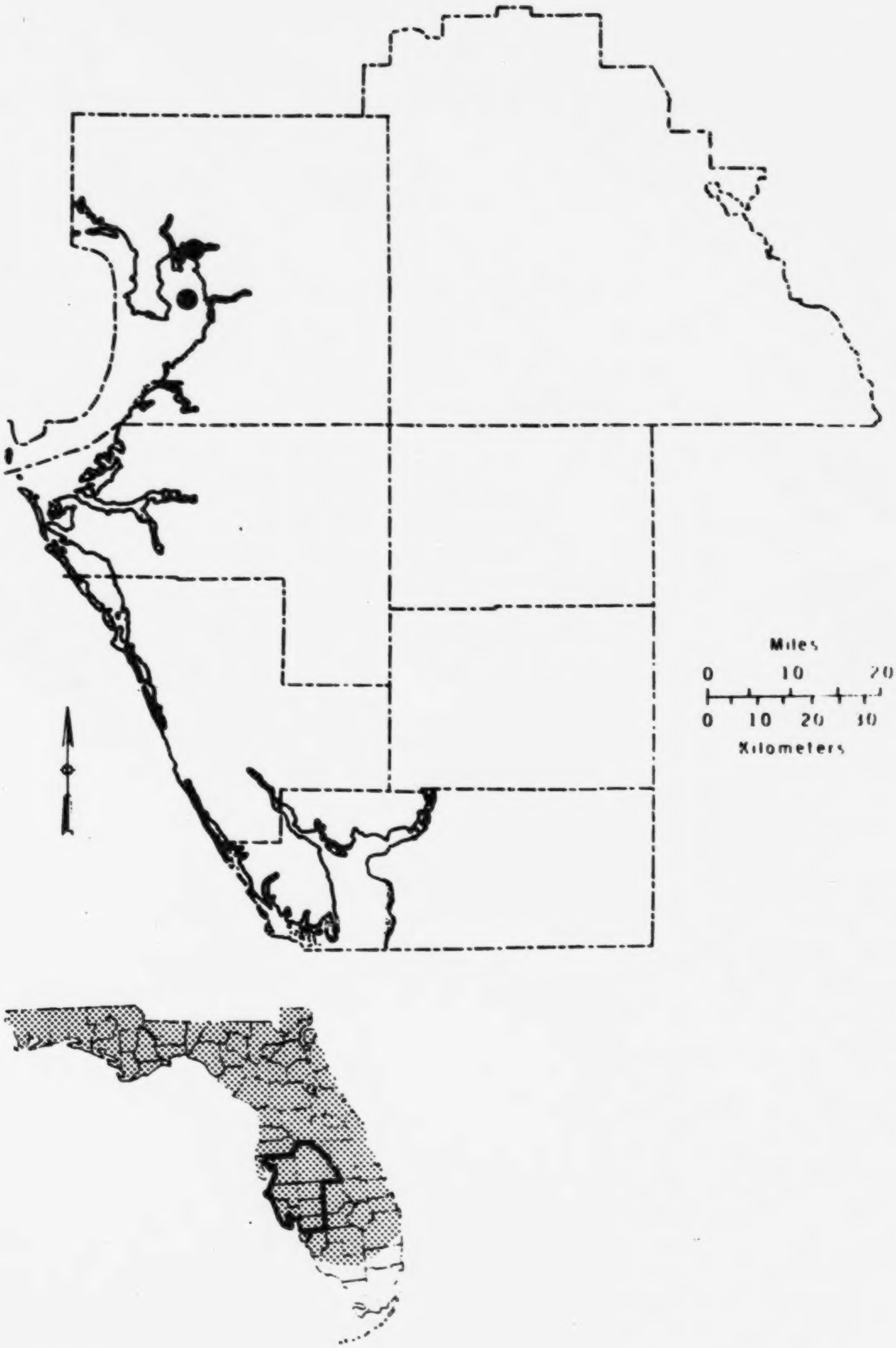
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Fig. VIII.D.44. EUROPEAN WIGEON (Anas penelope)

Game

AMERICAN WIGEON — *Anas americana* (Gmelin)

Order Anseriformes — Family Anatidae

Other Names: Baldpate

Distribution: Winter records of the American Wigeon in the seven-county area exist from all counties but DeSoto and Hardee. The species is known throughout Florida from September to May, and occasionally into the summer, and breeds in northwestern and north central North America.

Habitat: The American Wigeon is primarily an inhabitant of ponds, marshes, and sloughs. In the seven-county area it occurs mainly at inland localities (Table VIII.D.5). An exception is McKay Bay in Hillsborough County. Records exist from the Alafia and Little Manatee River basins (Dames and Moore 1975). There are numerous sightings from the Lower Lake at Myakka River State Park and from phosphate slime ponds in the Lakeland region. The species is rare in coastal regions (Table VIII.D.5).

Population Status: The American Wigeon is an uncommon winter resident in the seven-county area, although reported regularly from the Tampa, Myakka River State Park, Lakeland, and Lake Wales Christmas Bird Counts (Table VIII.D.5). Numbers seen on McKay Bay range from 15 to 2500 (Christmas Bird Counts 1972-1977) while at Myakka River State Park counts of from 7 to 526 have been recorded on the last eleven Christmas Bird Counts. From 2 to 145 birds have been reported in the 1970-1976 Christmas Bird Counts in Polk County (Lakeland and Lake Wales).

Basis for Priority Status: The American Wigeon is a game species, with a point value of 25 in the 1976-1977 state hunting regulations. Within the seven-county area it ranks sixth in average annual harvest (834), with 40 percent (335) and 33 percent (273) of the Wigeon shot coming from Polk and Charlotte counties, respectively. Hillsborough and Manatee County hunters took the remainder, averaging 23 percent (193) and 4 percent (33) respectively (Carney _et al_. 1975).

Potential Impacts of Mining: As the American Wigeon is highly dependent on inland wetlands, elimination of the natural wetlands preferred by the species will certainly affect its distribution and possibly its over-all population in the seven-county area. However, slime ponds resulting from mining should provide some compensation for loss of natural wetlands. Unless proper conditions are maintained by management, slime ponds may provide only relatively short-term benefits.

Selected References:

*Carney, S. M., M. F. Sorensen, and E. M. Martin. 1975. Distribution in states and counties of waterfowl species harvested during 1961-70 hunting seasons. U. S. Fish and Wildl. Serv. Spec. Sci. Rept. - Wildl. No. 187. 132 pp.

*Dames and Moore. 1975. Hydrobiologic assessment of the Alafia and Little Manatee rivers. Report prep. for the Southwest Fla. Water Management District by Dames and Moore, Consulting Engineers, Atlanta, Georgia.

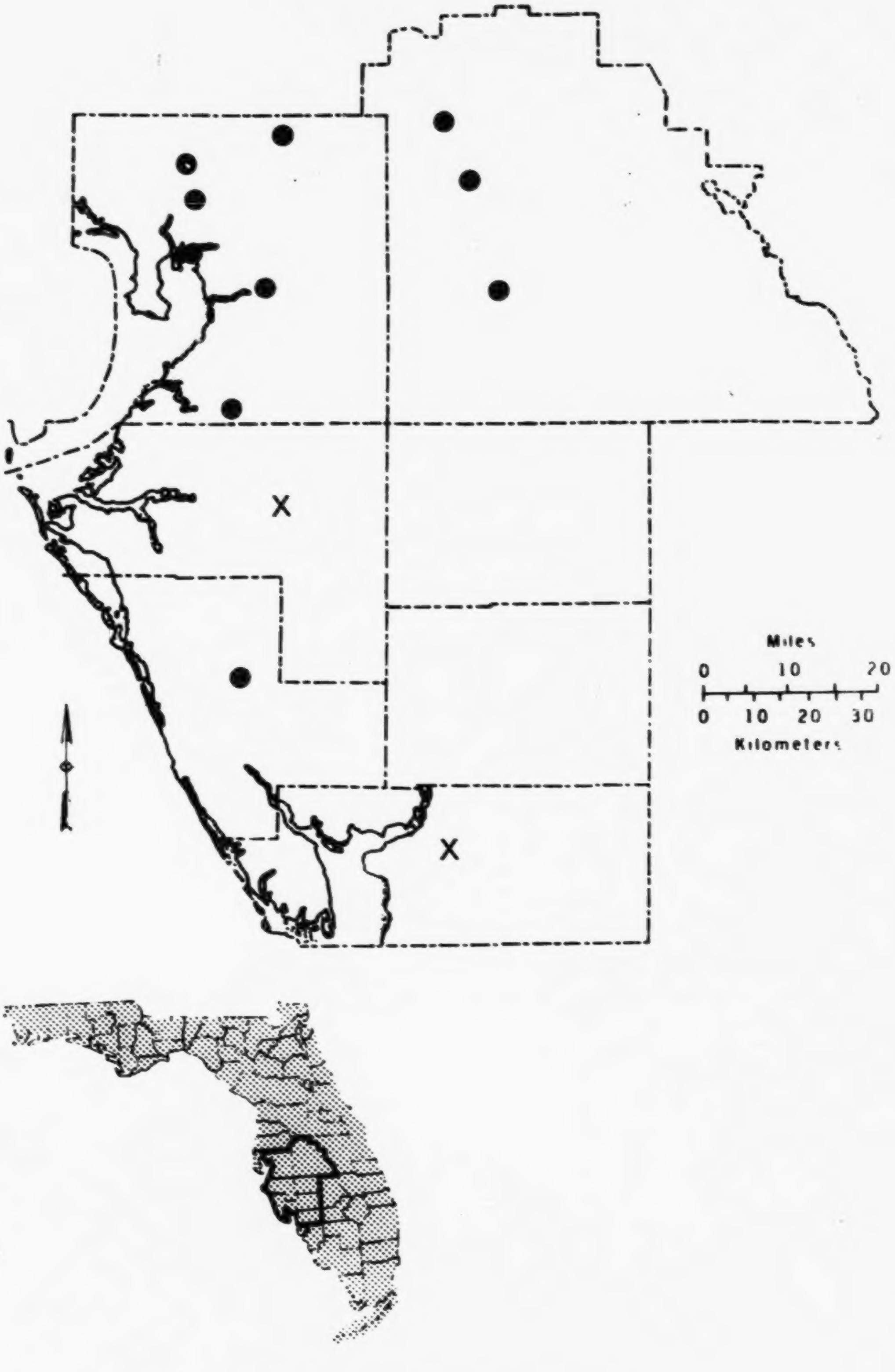
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Fig. VIII.D.45. AMERICAN WIGEON (*Anas americana*)

Game

NORTHERN SHOVELER   Anas clypeata (Linnaeus)

Order Anseriformes   Family Anatidae

Distribution: The Northern Shoveler is a regular winter resident in the seven-county area. Records of the species exist from all but DeSoto and Hardee counties. The species winters throughout mainland Florida from September to early June, and breeds in northwestern North America.

Habitat: The Northern Shoveler is more exclusively fresh water than most ducks found in Florida. It prefers extensive and exposed flats of soft mud and extremely shallow water. Thus, it is not surprising to find the greatest number of records from the upper reaches of McKay Bay, where the species feeds along the mucky shoreline, and in the phosphate slime ponds in Polk County, especially those covered only by a thin film of water. Temporary rainwater ponds and freshwater marshes also are reported habitats of the Shoveler. Table VIII.D.5 further illustrates these habitat preferences, with the species found in greatest abundance on the Tampa (59 per 10 party hours) and Lakeland (7 per 10 party hours) Christmas Bird Counts. Christmas Bird Counts in other regions of the seven-county area report the species irregularly in much smaller numbers, or none at all. In the Hillsborough and Myakka River state parks, the Shoveler is considered an occasional and uncommon winter resident.

Population Status: The Northern Shoveler is common and regular in its preferred habitat, but elsewhere it is uncommon or rare. High counts for the species' preferred sites include 1500 on McKay Bay (1971-72 Christmas Bird Count) and 200 at slime ponds near Lakeland on 9 December 1976

(B. Kittleson pers. comm.).

Basis for Priority Status: The Northern Shoveler is a game species, with a point value of 10 in the 1976-1977 state hunting regulations. It ranks eighth in average annual harvest (620), with 85 percent hunted successfully in those counties with the most suitable habitats, Hillsborough (302 killed) and Polk (232 killed) (Carney *et al*. 1975)

Potential Impacts of Mining: Elimination without replacement, of suitable interior habitat such as the shallow wetlands described above, would have a significant negative effect on the population levels of the Northern Shoveler in the seven-county area. Slime ponds with proper water levels and vegetative conditions resulting from mining might more than compensate for loss of natural wetland habitats of the species and result in a net increase in the area. However, with present reclamation practices, this trend would probably be relatively short-term.

Selected References:

*Carney, S. M., M. F. Sorensen, and E. M. Martin. 1975. Distribution in states and counties of waterfowl species harvested during 1961-70 hunting seasons. U. S. Fish and Wildl. Serv. Spec. Sci. Rept. - Wildl. No. 187. 132 pp.

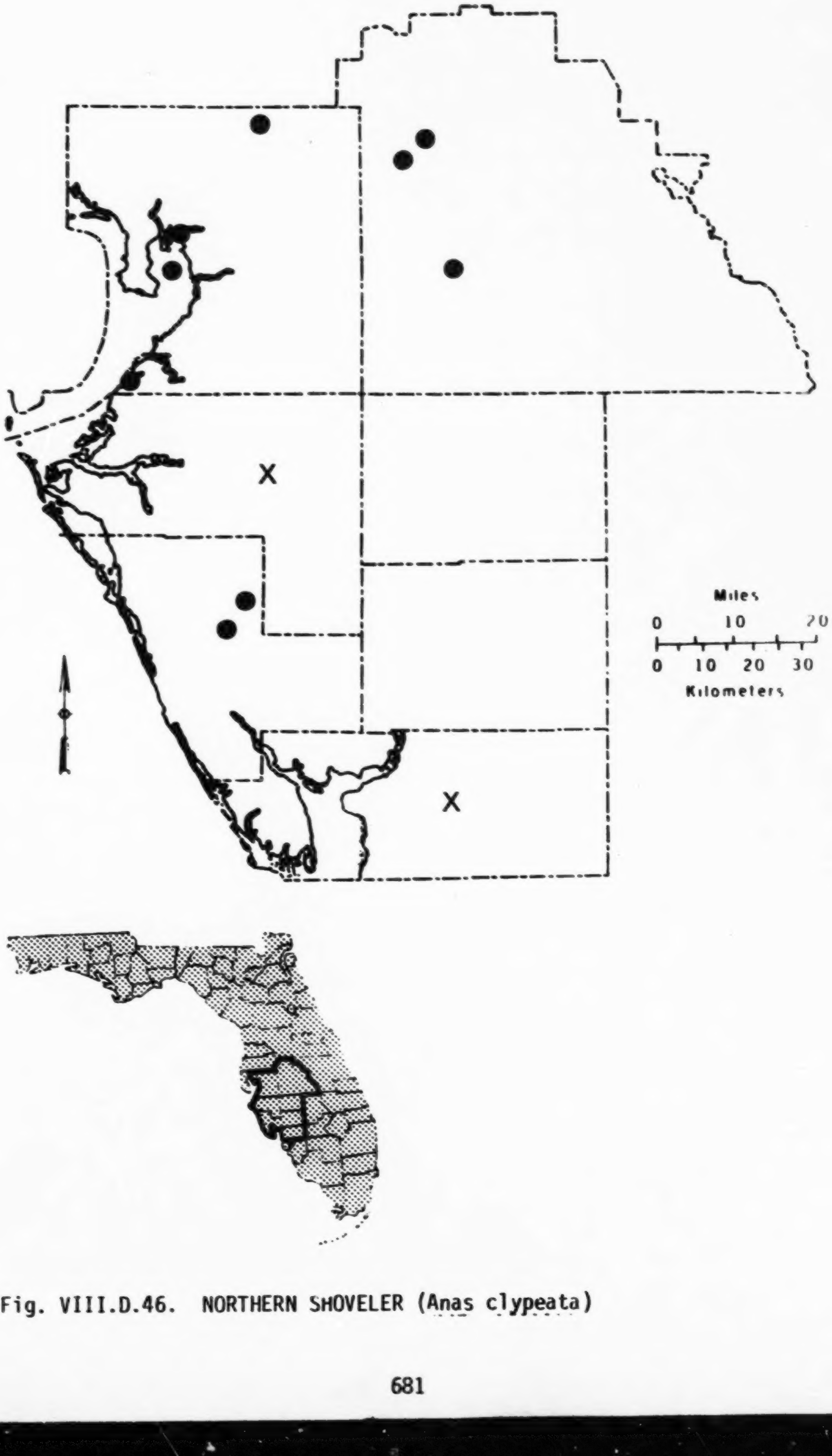
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Fig. VIII.D.46. NORTHERN SHOVELER (*Anas clypeata*)

Game

WOOD DUCK — Aix sponsa (Linnaeus)

Order Anseriformes — Family Anatidae

Distribution: The Wood Duck is a permanent resident in all seven counties of the study area and throughout Florida, with the exception of the Keys. Its breeding range extends northward from Florida through southeastern Canada and along the west coast of North America from southwestern British Columbia southward to central California. It winters in all but the northern parts of its breeding range.

Habitat: The Wood Duck, unlike most other ducks, is primarily a woodland species. It nests in hollow stubs or natural cavities in trees, preferably close to water. Within the seven-county area, the Wood Duck has been recorded most often in cypress swamps or wooded lakes. It also frequents mixed hardwood swamps and mesic hammocks bordering streams and rivers. Several records exist for heavily revegetated phosphate areas, particularly around slime ponds. Christmas Bird Counts in the area show the species prefers inland areas, with the greatest concentrations seen in the Lake Wales area, a region of many undisturbed lakes. Nesting records include Myakka and Hillsborough River state parks (Sarasota and Hillsborough counties), Mountain Lake Sanctuary and Orange Park (Polk County), and near Maple Creek (eastern Manatee County).

Population Status: The Wood Duck is a locally common permanent resident in the seven-county area. Howell (1932) considered the species to be increasing as a result of protective laws, but logging of some areas has reduced the number of available nest cavities with a subsequent decline in local populations (Smith 1970). In such instances, nest boxes have aided in the recovery of the population. The greatest number of Wood Ducks seen on Christmas Bird Counts within the past 11 years was 215 (1969-70 Lakeland count). The 1963-64 count in Myakka River State Park yielded a high of 101. Usually, from a pair to six individuals are recorded on single sightings, but K. C. Alvarez (pers. comm.) noted a flock of 30-40 at Lower Myakka Lake in Myakka River State Park on 10 May 1974. Morrison (1964) reported a colony of 200 birds at the Mountain Lake Sanctuary in Polk County.

Basis for Priority Status: The Wood Duck is a game species, with a point value of 70 in the 1976-1977 state hunting regulations. In spite of a rather strict bag limit on a species which is desired not only for its flesh but also for its feathers, the Wood Duck ranks a fairly high ninth in average annual harvest (615), with almost as many taken as Northern Shovelers. Polk County hunters account for 85 percent (522) of the kill, followed by 10 percent (61) in Hillsborough County, and 3 percent (20) in Manatee County. The remaining 2 percent is divided equally between DeSoto (6) and Sarasota (6) counties (Carney *et al*. 1975).

Potential Impacts of Mining: Because of its status as a breeder and because it relies heavily on forested areas as a part of its habitat requirement, the Wood Duck is likely to be affected severely by the wetlands habitat destruction which accompanies phosphate mining. The critical areas are the mature hardwood river swamps. Old slime ponds in advanced succession to hardwood swamps would partially compensate for loss of natural habitats. Provision of artificial nest boxes in more open slime ponds would encourage utilization by Wood Ducks.

Selected References:

*Carney, S. M., M. F. Sorensen, and E. M. Martin. 1975. Distribution in states and counties of waterfowl species harvested during 1961-70 hunting seasons. U. S. Fish and Wildl. Serv. Spec. Sci. Rept. - Wildl. No. 187. 132 pp.

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

*Morrison, K. D. 1964. Lake Wales area. Fla. Nat. 37(3):83.

*Smith, G. 1970. Swift winged-and colorful. Fla. Wildl. 24(7):20-23.

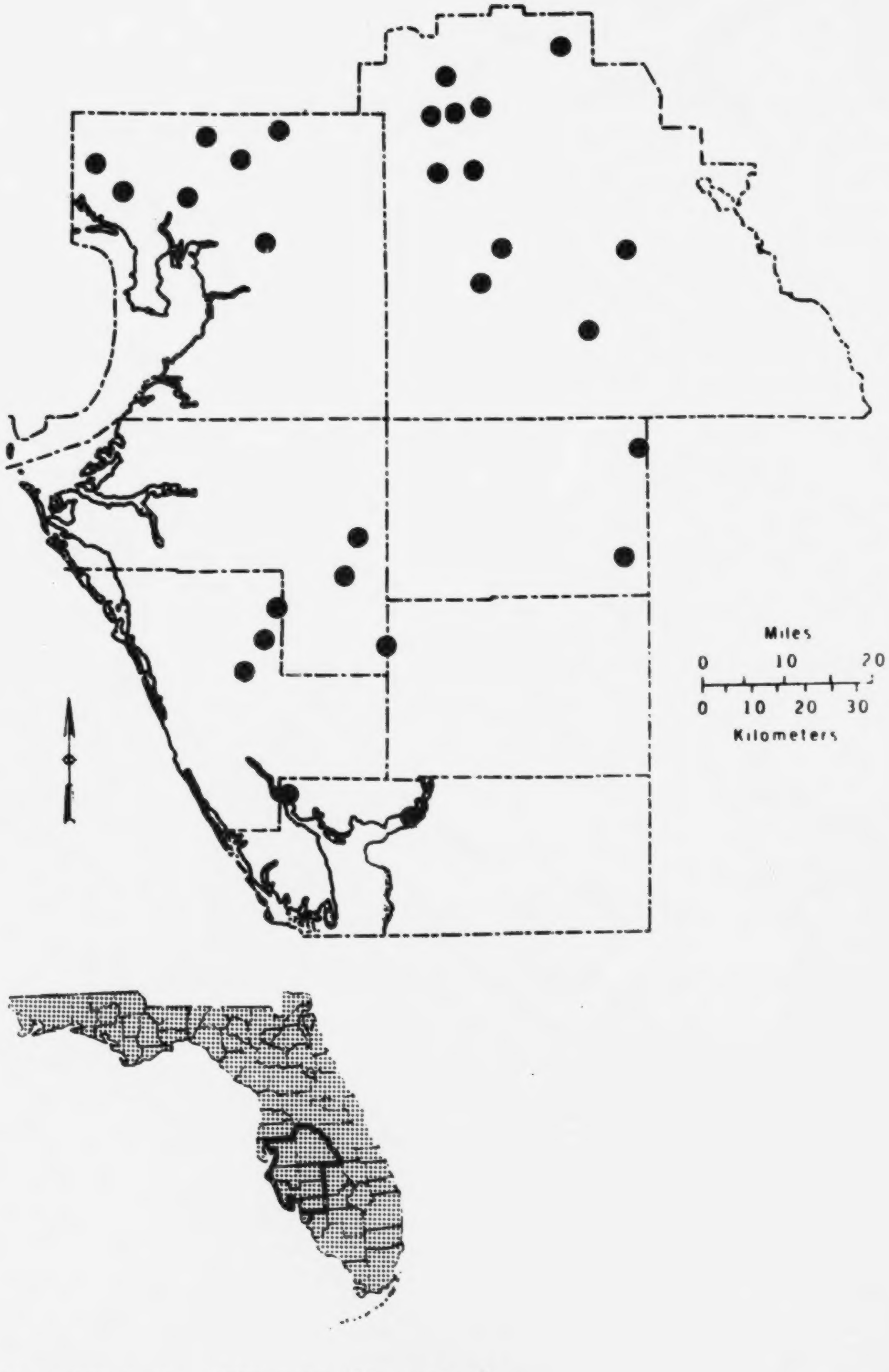
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Fig. VIII.D.47. WOOD DUCK (Aix sponsa)

REDHEAD *Aythya americana* (Eyton)

Order Anseriformes Family Anatidae

Distribution: Winter records of the Redhead exist for all counties but DeSoto and Hardee in the seven-county area. In Florida, it is a winter resident which concentrates in the northern part of the state. The species may be found in Florida from October to May, occasionally later. It breeds in northwestern and north central North America.

Habitat: The Redhead is similar in habits to the Canvasback, but with a slightly greater preference for fresh water. Within the seven-county area, there are records of the species on lakes (Myakka River State Park), ponds (Hillsborough and Polk counties), and estuaries (McKay Bay). Like the Canvasback, the Redhead is rare along the coast.

Population Status: Because the Redhead is a rare and irregular winter visitor to Florida, it is difficult to quantify its status within the seven-county area. Varied breeding success in the northern part of its range may be one factor affecting its erratic occurrence in Florida. When seen in the seven-county area, Redheads are usually in groups of less than five, and the highest total for any Christmas Bird Count in the study area was that of 20 seen on the 1975-76 Tampa count.

Basis for Priority Status: The Redhead is a game species, with a point value of 70 in the 1976-1977 state hunting regulations. It ranks nineteenth of 22 waterfowl species in average annual harvest in the seven-county area (19), with kills about evenly distributed through Charlotte (7), Polk (7), and Manatee (5) counties (Carney *et al*. 1975).

Potential Impacts of Mining: Because of the Redhead's habitat preferences and rarity within the seven-county area, it is difficult to predict the impacts of phosphate mining on the species. However, it appears that mining activities would have little effect on its status in the seven-county area.

Selected References:

*Carney, S. M., M. F. Sorensen, and E. M. Martin. 1975. Distribution in states and counties of waterfowl species harvested during 1961-70 hunting seasons. U. S. Fish and Wildl. Serv. Spec. Sci. Rept. - Wildl. No. 187. 132 pp.

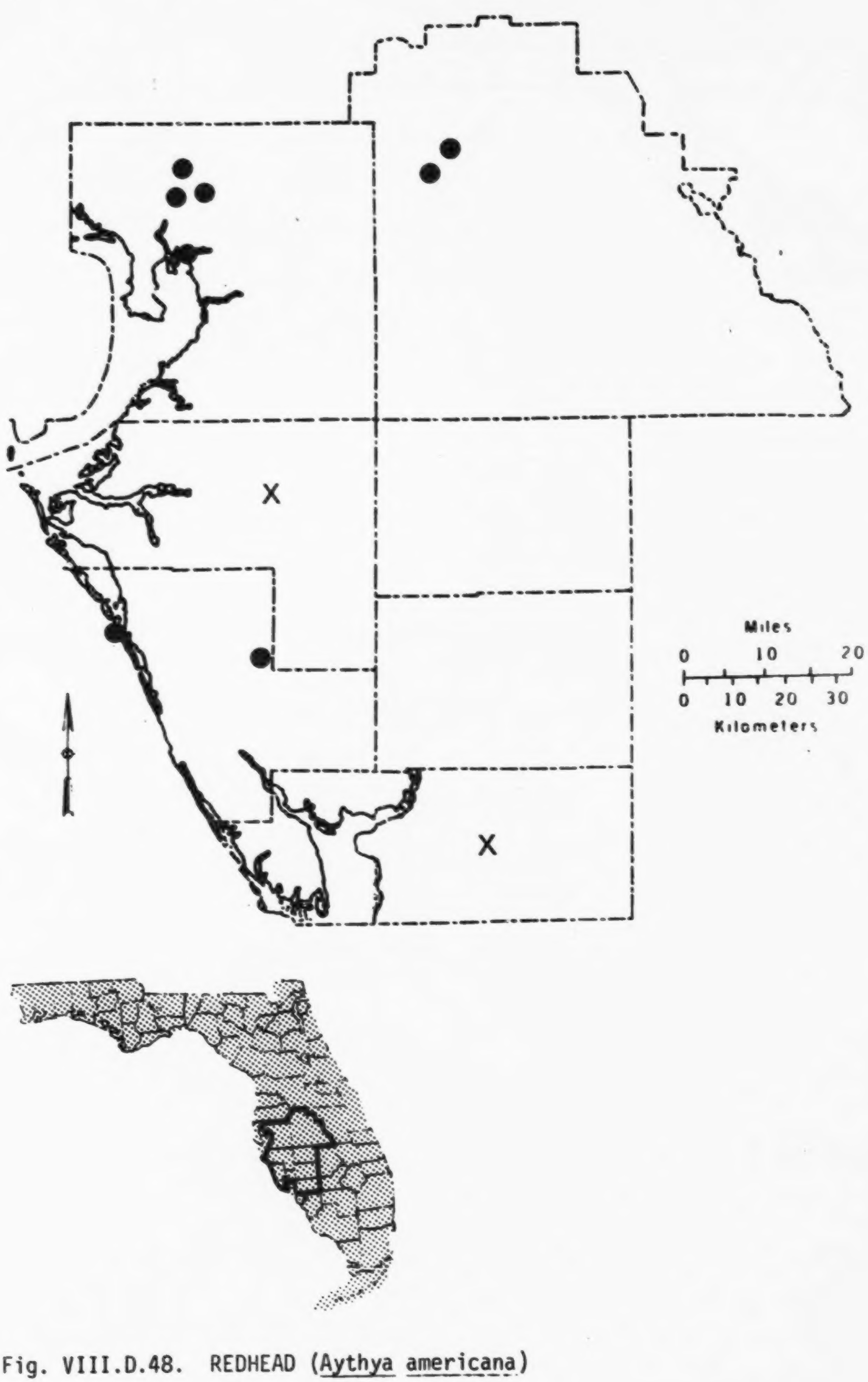
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Fig. VIII.D.48. REDHEAD (Aythya americana)

Game

RING-NECKED DUCK *Aythya collaris* (Donovan)

Order Anseriformes Family Anatidae

Other Names: Ring-billed Duck

Distribution: The Ring-necked Duck is a winter resident in the seven-county area, reported from every county except DeSoto and Hardee. It occurs throughout Florida, though in scattered localities and in varying numbers, depending on the availability of suitable habitat. The Ring-necked Duck arrives in Florida in October and, with the exception of an occasional summer straggler, departs in April for northern North America where the species breeds.

Habitat: The Ring-necked Duck prefers fresh water and is rarely seen on salt water. Within the seven-county area, most records are from lakes and artificial freshwater impoundments, such as phosphate slime ponds and mine excavations. Christmas Bird Counts (Table VIII.D.5) indicate these habitat preferences, in that the species is recorded in greatest abundance on the Myakka River State Park and Lake Wales counts, both of which cover areas with many lakes. The Tampa and Lakeland counts also report substantial numbers of Ring-necked Ducks. In phosphate areas, this duck species predominates, along with the Lesser Scaup, on deeper mine excavations which have been filled with water, as opposed to the generally shallower slime ponds (Fla. Game and Fresh Water Fish Comm. unpubl. MS).

Population Status: The Ring-necked Duck is an abundant winter resident. Numbers seen on Christmas Bird Counts in the last ten years range from 11 to 813 for Myakka River State Park, 135 to 1020 for Tampa, 182 to 1080 for

Lake Wales, and 76 to a high of 3223 for Lakeland.

Basis for Priority Status: The Ring-necked Duck is a game species, with a point value of 25 in the 1976-1977 state hunting regulations. It is the most hunted waterfowl in the seven-county area with an average annual harvest of 2659. Most (84 percent) of this number are taken in Polk County (2229), while 11 percent and 5 percent are taken from Hillsborough (282) and Charlotte (139) counties, respectively (Carney *et al*. 1975).

Potential Impacts of Mining: Since relatively few natural bodies of water of the type preferred by this species would be destroyed by mining, while many suitable artificial freshwater impoundments would be created, wintering populations of this species would probably increase as the result of mining in the seven-county area.

Selected References:

*Carney, S. M., M. F. Sorensen, and E. M. Martin. 1975. Distribution in states and counties of waterfowl species harvested during 1961-70 hunting seasons. U. S. Fish and Wildl. Serv. Spec. Sci. Rept. - Wildl. No. 187. 132 pp.

*Florida Game and Fresh Water Fish Commission. An evaluation of waterfowl habitat on phosphate mine lands. Unpubl. MS. 7 pp.

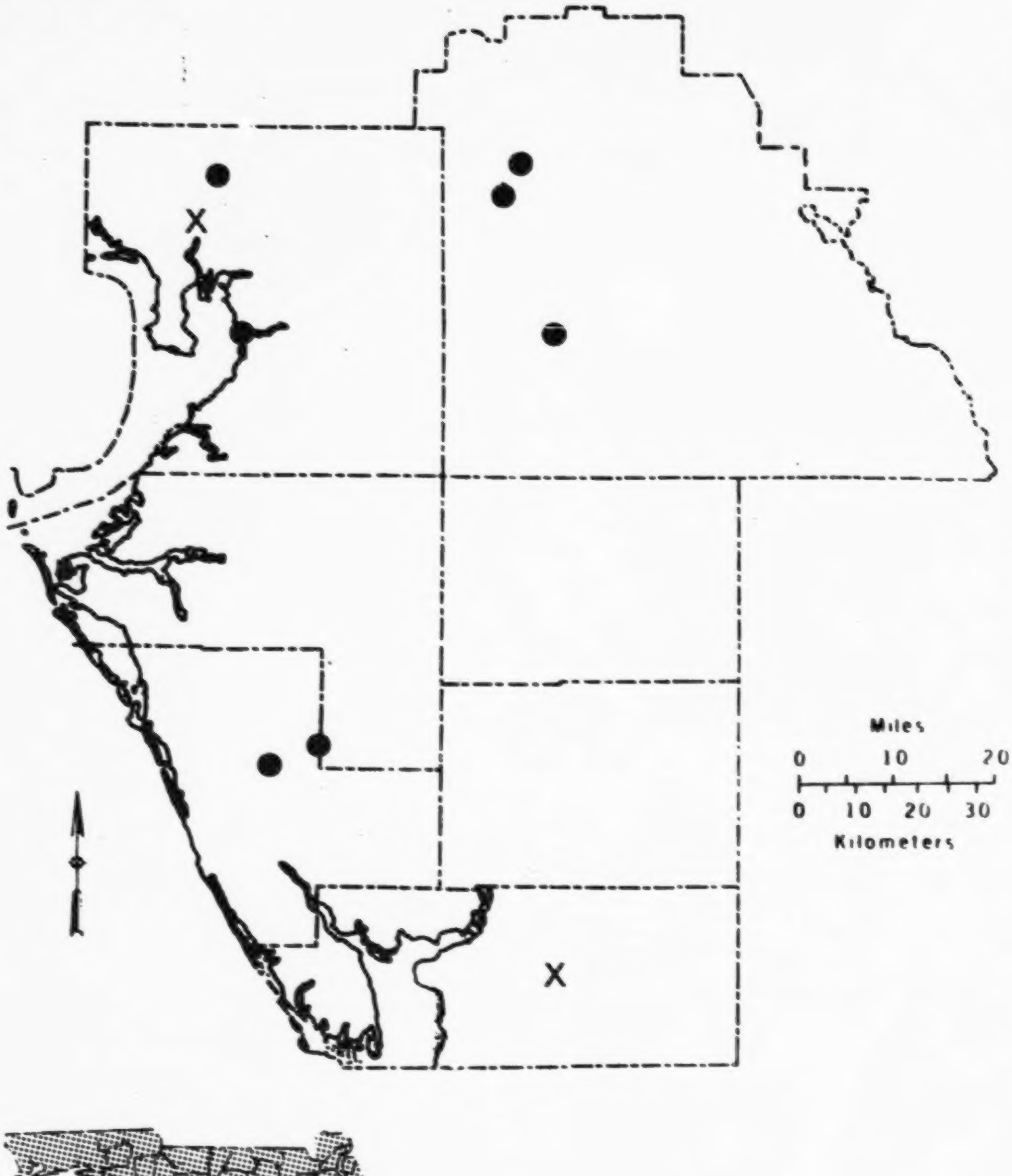
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Fig. VIII.D.49. RING-NECKED DUCK (*Aythya collaris*)

Listed - Blue List

Game

CANVASBACK Aythya valisineria (Wilson)

Order Anseriformes Family Anatidae

Distribution: The Canvasback has been recorded as a winter resident in Hillsborough, Manatee, Polk, and Sarasota counties. Although it occurs in all regions of mainland Florida, it is more likely to be encountered in numbers in the northern part of the state. Present data suggest it is more frequent in the northern part of the seven-county area. The species breeds in northwestern North America and winters regularly in Florida from November to April. It is rarely recorded in the summer.

Habitat: The Canvasback prefers large, shallow lakes and the upper reaches of estuaries. Christmas Bird Counts report the largest concentrations in lakes and ponds of the Lake Wales area and on McKay Bay near Tampa. Records of the species exist from the Lower Myakka Lake in Myakka River State Park and various lakes and ponds in Hillsborough and Polk counties.

Population Status: The Canvasback is a rare, but regular, winter resident. At McKay Bay, a preferred habitat within the seven-county area, it is found in flocks of from 140 to 1000 (Christmas Bird Counts). On lakes and ponds within the study area, numbers of 20 to 40 are more usual, though larger lakes just outside the study area, such as Lake Jackson in Highlands County, may have as many as 1000 Canvasbacks at any one time (J. A. Stallcup pers. comm.).

Basis for Priority Status: The Canvasback is included on the 1977 Blue List of the National Audubon Society and is also a game species, with a point value of 100 in the 1976-1977 state hunting regulations. Of 22 waterfowl species, it ranks sixteenth in average annual harvest (76), with 97 percent being taken in Hillsborough County (74) and the remainder in Polk (2) (Carney *et al*. 1975).

Potential Impacts of Mining: Because of the Canvasback's habitat preferences and rarity within the study area, it is difficult to assess potential impacts of phosphate mining on the species. However, any effects, either positive or negative, would probably be minimal. On balance, the species might be slightly favored by mining. Few or no natural habitats in the seven-county area presently supporting good winter populations are likely to be seriously affected by mining and some types of artificial water bodies created in mining and reclamation might provide suitable conditions for this species.

Selected References:

*Carney, S. M., M. F. Sorensen, and E. M. Martin. 1975. Distribution in states and counties of waterfowl species harvested during 1961-70 hunting seasons. U. S. Fish and Wildl. Serv. Spec. Sci. Rept. - Wildl. No. 187. 132 pp.

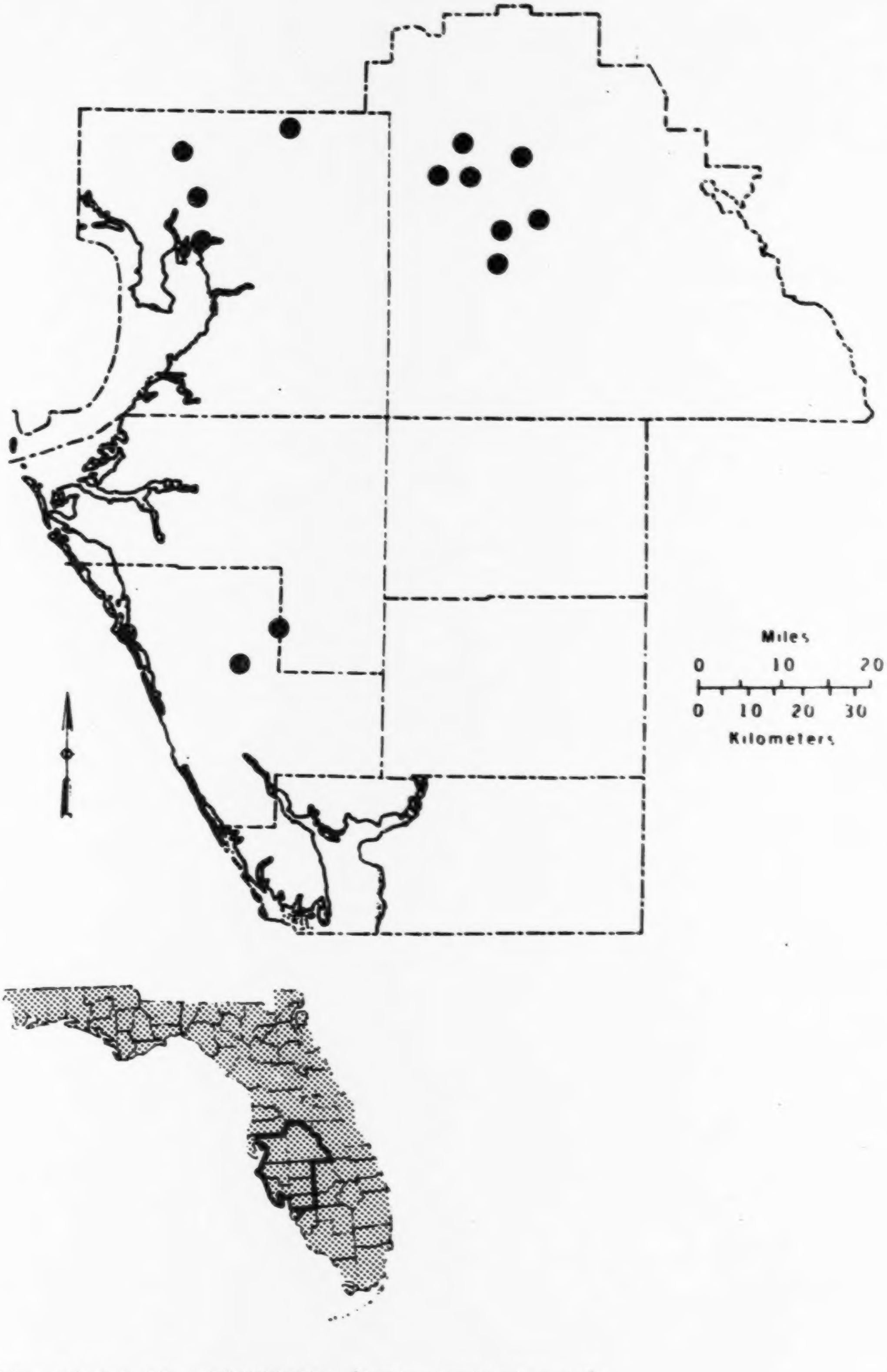
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Fig. VIII.D.50. CANVASBACK (*Aythya valisineria*)

Game

GREATER SCAUP Aythya marila (Linnaeus)

Order Anseriformes Family Anatidae

Distribution: The status of the Greater Scaup in the seven-county area is poorly known because of the great difficulty in distinguishing this species from the locally abundant Lesser Scaup. Records of the Greater Scaup exist for five of the seven counties, the exceptions are DeSoto and Hardee. However, Edscorn (unpubl. MS) considers the species of hypothetical occurrence in Polk County. Records from Florida span the winter months, from November to June, with a few records from summer (Stevenson 1976). The normal breeding range includes Alaska and northwestern Canada.

Habitat: The Greater Scaup is largely a maritime species in winter. Only rarely is it found inland in Florida on large lakes or rivers. Of the records from the seven-county area, all but one sighting are coastal.

Population Status: Though difficult to determine because of its similarity to a locally abundant bird, the Greater Scaup probably is rare in the seven-county area.

Basis for Priority Status: The Greater Scaup is a game species, with a point value of 10 in the 1976-1977 state hunting regulations. It ranks eighteenth of 22 waterfowl in terms of average annual harvest (71). Successful hunting is recorded solely from the coastal counties of Hillsborough and Charlotte, with an average harvest of 65 (92 percent) in the former and 6 (8 percent) in the latter (Carney et al. 1975).

Potential Impacts of Mining: Inland mining activities should have little effect beyond those which might alter the larger rivers and estuaries of the Gulf. Any impacts of mining on the species would probably be negligible at most.

Selected References:

*Carney, S. M., M. F. Sorensen, and E. M. Martin. 1975. Distribution in states and counties of waterfowl species harvested during 1961-70 hunting seasons. U. S. Fish and Wildl. Serv. Spec. Sci. Rept. - Wildl. No. 187. 132 pp.

*Edscorn, J. B. Birds of the Lake Region. Unpubl. MS.

*Stevenson, H. M. 1976. Vertebrates of Florida, identification and distribution. Univ. Presses of Fla., Gainesville. 607 pp.

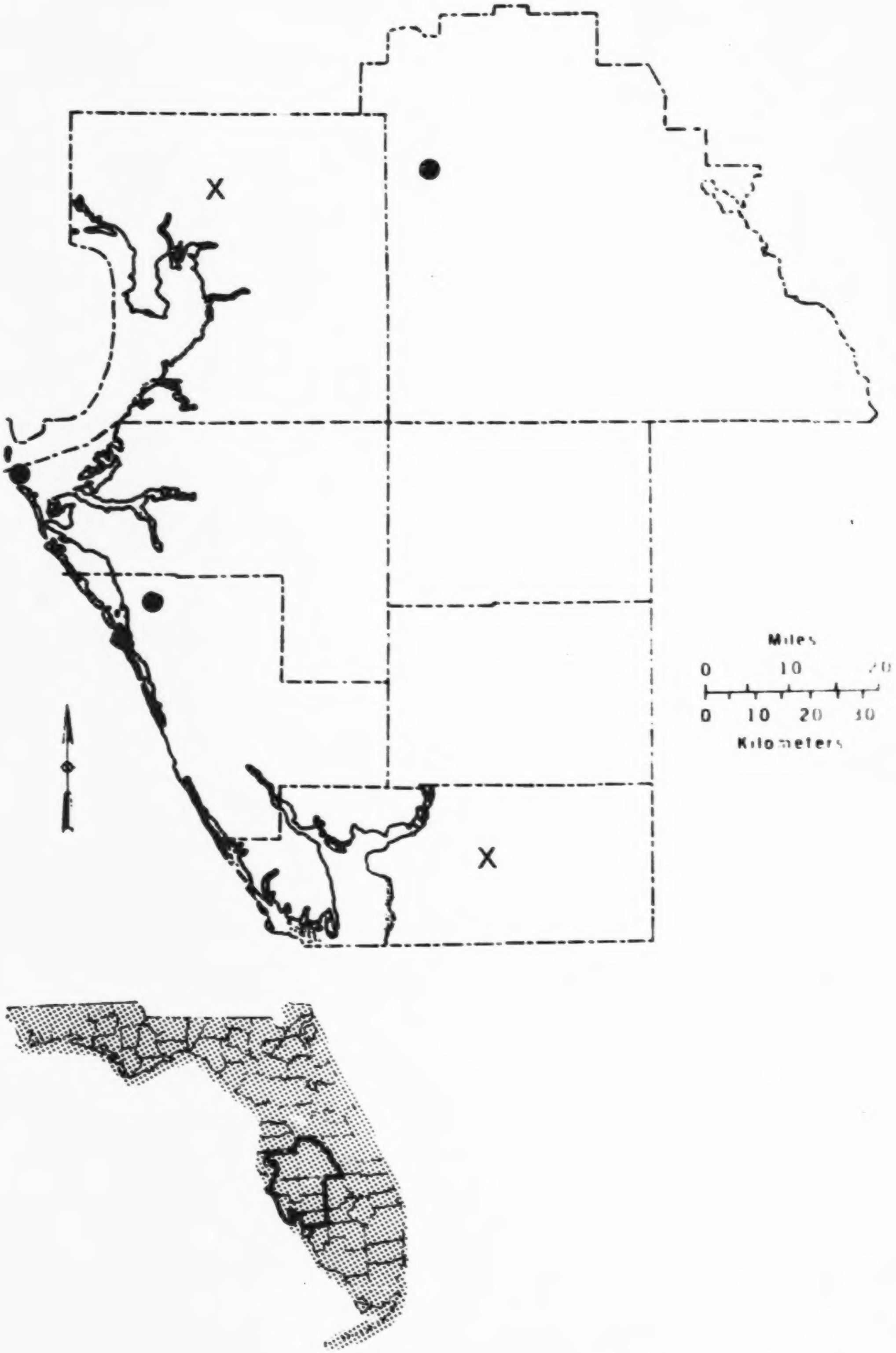
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Fig. VIII.D.51. GREATER SCAUP (*Aythya marila*)

Game

LESSER SCAUP *Aythya* *affinis* (Eyton)

Order Anseriformes Family Anatidae

Distribution: The Lesser Scaup is a regular winter resident in the seven-county area, with records available from all but DeSoto County. The species breeds in northwestern and north central North America; rarely a few breed in Florida (Stevenson 1976).

Habitat: Though often found on large bodies of fresh water, the Lesser Scaup is more numerous in estuaries such as Tampa and McKay bays, and Charlotte Harbor in the study area.

Population Status: The Lesser Scaup is the most abundant duck in Florida (Howell 1932, and Sprunt 1954). It is found regularly from October to May in large rafts, which sometimes include well over 10,000 individuals. The largest concentrations in the study area are at localities such as Tampa Bay in early spring shortly before migration (Woolfenden and Schreiber 1973). Hewitt (1976) estimates that 50,000 Lesser Scaup winter in Charlotte Harbor and Tampa Bay alone. On 1 January 1977, an estimated 12,000 were on McKay Bay (G. E. Woolfenden pers. comm.), and counts of 1000 to 3000 individuals are common on the Bradenton Christmas Bird Counts. Lesser numbers, though still large in comparison to other waterfowl, are recorded inland. The high count for the Lakeland area was 1223 on the 1975-76 Christmas Bird Count.

Basis for Priority Status: The Lesser Scaup is a game species, with a point value of 10 in the 1976-1977 state hunting regulations. It ranks fourth among the ducks killed in the seven-county area, with an average annual harvest of 1640 (Carney *et al*. 1975). Sixty-four percent of the take is from Hillsborough County (1047), 22 percent from Polk (358), and the remainder from Charlotte (115), Manatee (94), and Hardee (26) counties (Carney et al. 1975).

Potential Impacts of Mining: Reclamation after mining that results in formation of large lakes could increase Lesser Scaup habitat. Coastal development that alters natural estuaries would decrease Lesser Scaup habitat. On balance, mining in the [illegible]en-county area would probably have an over-all beneficial impact on this species.

Selected References:

*Carney, S. M., M. F. Sorensen, and E. M. Martin. 1975. Distribution in states and counties of waterfowl species harvested during 1961-70 hunting seasons. U. S. Fish and Wildl. Serv. Spec. Sci. Rept. - Wildl. No. 187. 132 pp.

*Hewitt, O. H. 1976. Fieldbook of birds of the Florida suncoast. Mote Marine Lab., Sarasota, Florida. 150 pp.

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

*Sprunt, A., Jr. 1954. Florida bird life. Coward-McCann, Inc. New York. 527 pp.

*Stevenson, H. M. 1976. Vertebrates of Florida, identification and distribution. Univ. Presses of Fla., Gainesville. 607 pp.

*Woolfenden, G. E., and R. W. Schreiber. 1973. The common birds of the saline habitats of the eastern Gulf of Mexico: their distribution, seasonal status, and feeding ecology, Pages IIIJ-1 - IIIJ-21 in A summary of knowledge of the eastern Gulf of Mexico 1973. State Univ. System of Fla. Instit. of Oceanography, St. Petersburg, Florida.

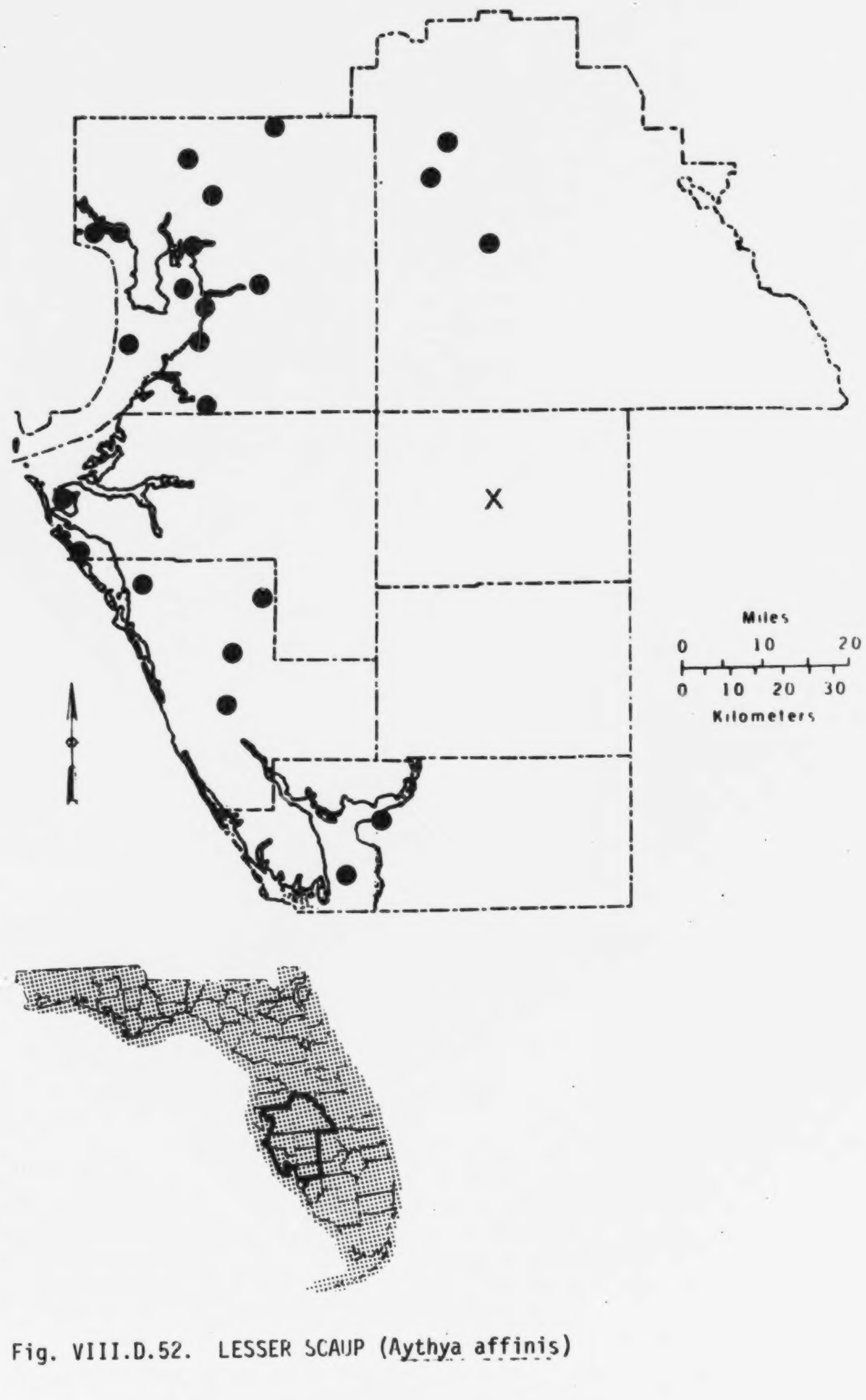
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Fig. VIII.D.52. LESSER SCAUP (*Aythya affinis*)

Game

COMMON GOLDENEYE | Bucephala clangula (Linnaeus)

Order Anseriformes | Family Anatidae

Distribution: The Common Goldeneye has been recorded twice in the seven-county area: at Orange Park Mine, Polk County, on 9-10 January 1971 and at Lake Hancock, Polk County, on 25 February 1973 (J. B. Edscorn pers. comm., 1974). The species has been sighted generally over the state from November to April, but is regular only along the coast of the panhandle (Sprunt 1954). The species breeds in northern North America.

Habitat: One record of Common Goldeneye from the seven-county area was from a freshwater lake and the other a large phosphate settling basin.

Population Status: This species is very rare in the seven-county area and in Florida generally.

Basis for Priority Status: The Common Goldeneye is a game species with a point value of 25 in the 1976-1977 state hunting regulations.

Potential Impacts of Mining: The rarity of this species in the seven-county area does not warrant impact assessment. It should be noted, however, that J. B. Edscorn (pers. comm.) remarks that large bodies of open water in phosphate settling basins approximate the normal wintering grounds of this species along the coast.

Selected References:

*Edscorn, J. B. 1974. Avian highlights of the year. Lake Region Nat., Fall-Winter 1973-1974.

*Sprunt, A., Jr. 1954. Florida bird life. Coward-McCann, Inc., New York. 527 pp.

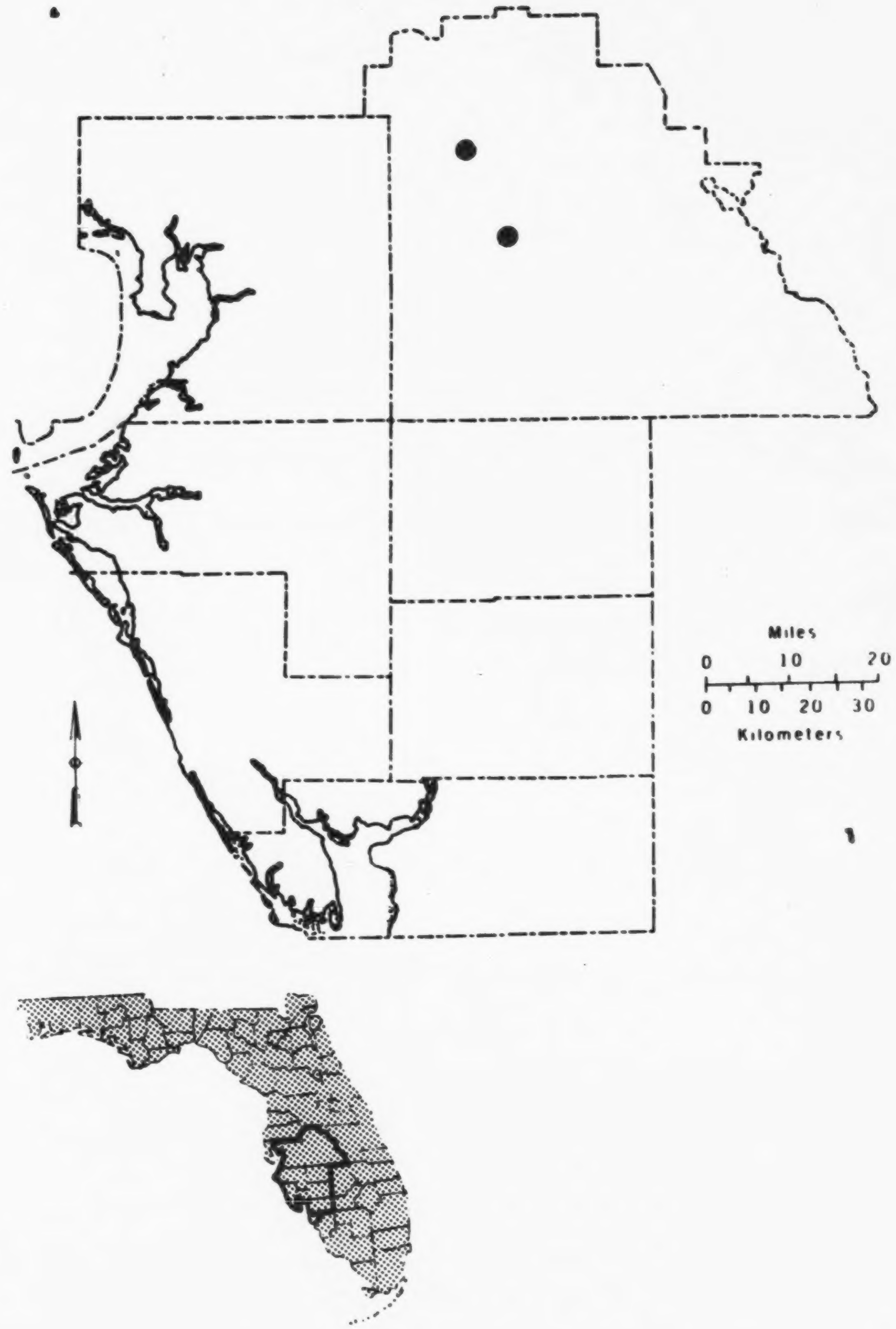
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Fig. VIII.D.53. COMMON GOLDENEYE (*Bucephala clangula*)

Game

BUFFLEHEAD Bucephala albeola (Linnaeus)

Order Anseriformes Family Anatidae

Distribution: The Bufflehead has been recorded as a winter resident in every county in the study area except DeSoto and Hardee. The species is decidedly more numerous in the panhandle than in the peninsula of Florida, but winter records exist from throughout the state. The Bufflehead occurs in Florida from November to April; it breeds in northwestern North America.

Habitat: In other parts of its range the Bufflehead is essentially a salt water species, and in northern Florida it resides chiefly along the Gulf coast. However, records of the species from the study area are too few for meaningful habitat analysis. The few records from the study area include slime ponds, pasture ponds, and McKay and Boca Ciega bays (G. E. Woolfenden pers. comm.).

Population Status: The Bufflehead is a rare and irregular winter visitor in the seven-county area. It is recorded on two of seven Tampa Christmas Bird Counts. From 1966 to 1976 it is reported for six, three, and one of the Lakeland, Sarasota, and Lake Wales counts, respectively. The greatest number seen on any one count in this 11-year period was 11 in the Lakeland area in 1966. Most sightings of this species, however, number five or fewer birds.

Basis for Priority Status: The Bufflehead is a game species, with a point value of 25 in the 1976-1977 state hunting regulations. Based on the data of Carney et al. (1975), it ranks 15th in annual harvest (77) in the seven-county area, with 90 percent taken in Polk County (69) and the rest from

Hillsborough County (8).

Potential Impacts of Mining: Assessment of any direct impacts of mining on this particular species is difficult because of its rarity within the seven-county area. Reduction of suitable habitat, however, could potentially affect the Bufflehead in the same manner as other waterfowl.

Selected References:

*Carney, S. M., M. F. Sorensen, and E. M. Martin. 1975. Distribution in states and counties of waterfowl species harvested during 1961-70 hunting seasons. U. S. Fish and Wildl. Serv. Spec. Sci. Rept. - Wild. No. 187. 132 pp.

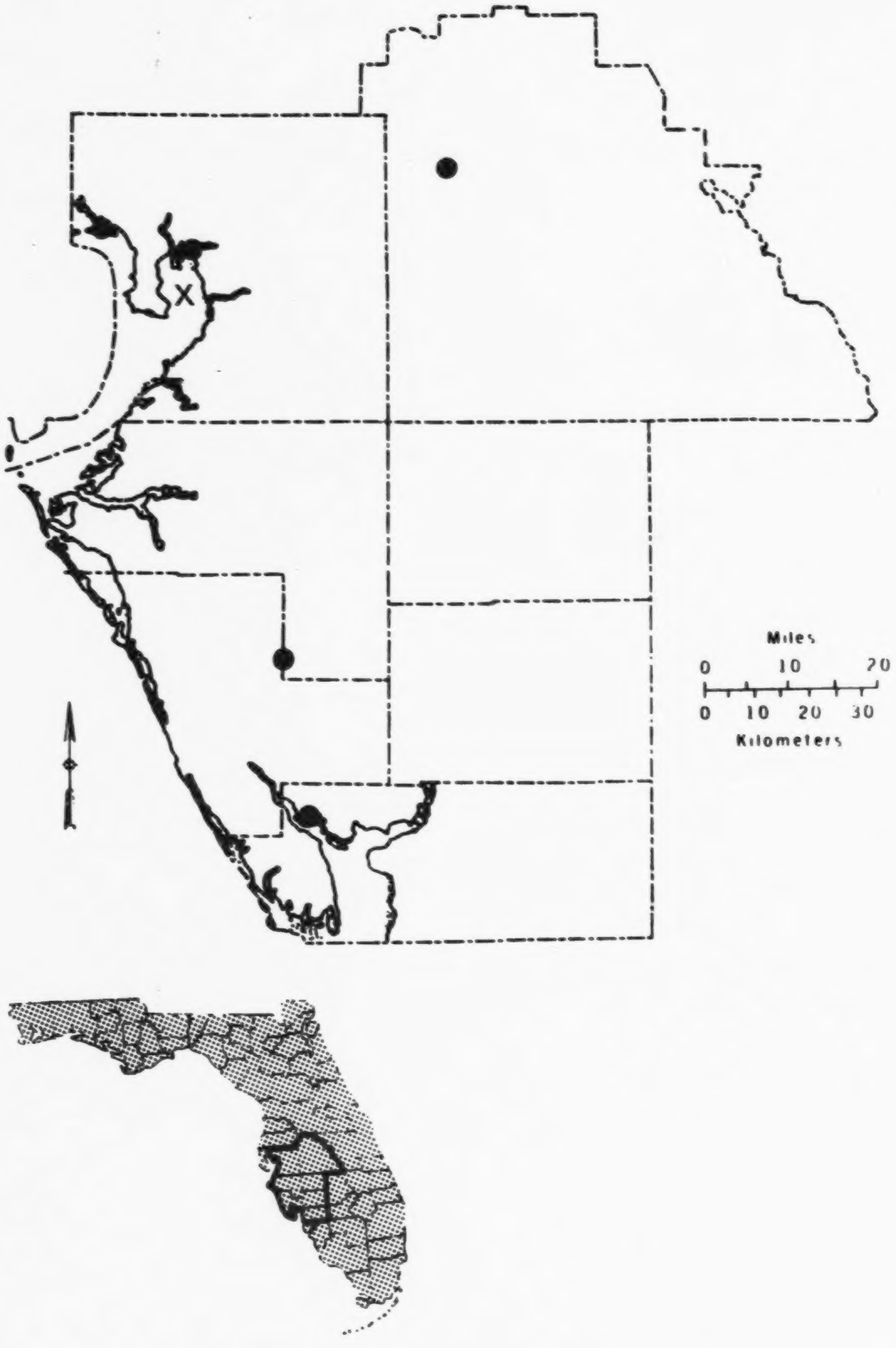
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Fig. VIII.D.54. BUFFLEHEAD (Bucephala albeola)

Game

OLDSQUAW   Clangula hyemalis (Linnaeus)

Order Anseriformes   Family Anatidae

Distribution: The Oldsquaw has been recorded in the seven-county area only in Hillsborough, Manatee, and Sarasota counties. The species breeds in northern Canada and Alaska and occurs in Florida as a winter resident from November to March (rarely later).

Habitat: The Oldsquaw is a sea duck which is seldom seen inland. Records from the seven-county area, all of which are within the last five years, are all coastal. The first interior peninsular record was at Sebring, Highlands County, in February 1976 (Edscorn 1976).

Population Status: The Oldsquaw is rare in the seven-county area. Howell (1932) classed it as a rare winter visitor along the east and west coasts of Florida.

Basis for Priority Status: The Oldsquaw is a game species, with a point value of 10 in the 1976-1977 state hunting regulations. In terms of annual harvest in the seven-county area, the Oldsquaw ranks last of 22 waterfowl game species, with an annual average of 7 over the period 1961-1970, taken exclusively from Hillsborough County (Carney *et al*. 1975).

Potential Impacts of Mining: Mining activities in the seven-county area will have no significant effect on this locally rare bird.

Selected References:

*Carney, S. M., M. F. Sorensen, and E. M. Martin. 1975. Distribution in states and counties of waterfowl species harvested during 1961-70 hunting seasons. U. S. Fish and Wildl. Serv. Spec. Sci. Rept. -

Wildl. No. 187. 132 pp.

*Edscorn, J. B. 1976. Avian highlights of the year. Lake Region Nat. 1976-77. pp. 17-19.

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

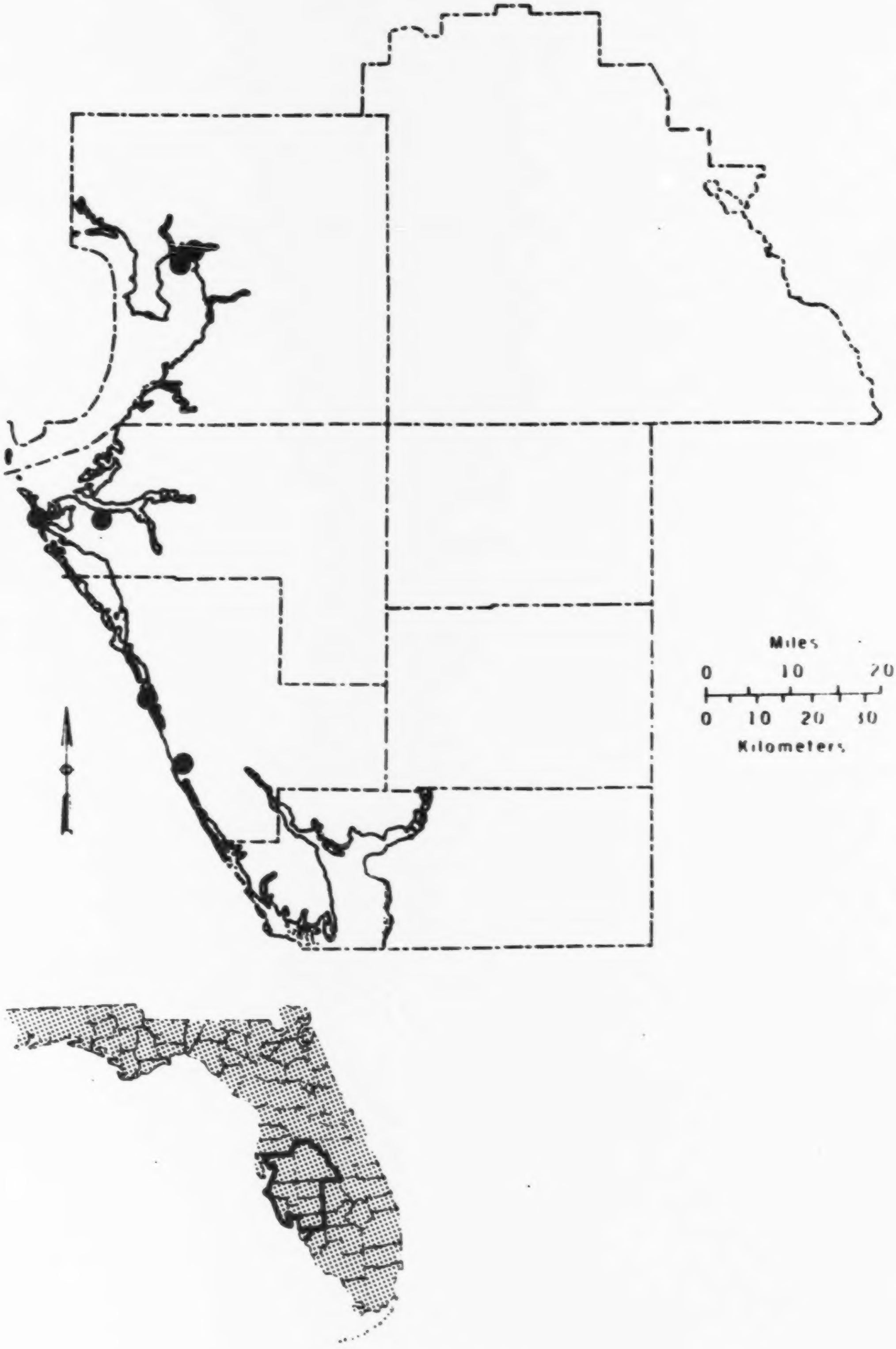
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Fig. VIII.D.55. OLDSQUAW (Clangula hyemalis)

Game

COMMON EIDER

Somateria mollissima (Linnaeus)

Order Anseriformes

Family Anatidae

One of the four Florida records of the Common Eider was at Tampa Bay, Hillsborough County, 14 December 1958 (Sprunt 1958). This maritime species breeds in arctic North America and is considered a game species.

The Common Eider is assigned a point value of 10 in the 1976-1977 state hunting regulations. Mining activities should have no effect on the status of this very rare species in the seven-county area.

Selected References:

*Sprunt, A., Jr. 1958. Second record for Common Eider in Florida. Fla. Nat. 31(2):58.

Game

WHITE-WINGED SCOTER — *Melanitta deglandi* (Bonaparte)

Order Anseriformes — Family Anatidae

Distribution: The White-winged Scoter is recorded from Hillsborough, Polk, and Sarasota counties. Most peninsular Florida records date from November to April (Stevenson 1976). The species breeds in northern North America and winters in numbers south to northern Florida.

Habitat: The White-winged Scoter is predominantly a maritime species on its wintering grounds. However, in the seven-county area it has been recorded both coastally (Tampa Bay, Hillsborough County; Longboat Key, Sarasota County) and inland (Saddle Creek Park and Auburndale, Polk County) on phosphate settling basins, old phosphate pits, and lakes (J. B. Edscorn pers. comm.).

Population Status: This species is very rare in the study area.

Basis for Priority Status: The White-winged Scoter is a game species with a point value of 10 points in the 1976-1977 state hunting regulations. None were taken by hunters in the seven-county area in the period 1961-1970 (Carney *et al*. 1975).

Potential Impacts of Mining: Because of the rarity of the White-winged Scoter in the study area, its status will not be affected by mining activities. An increase of large slime ponds in the region might increase the probability of inland occurrences, but this effect, if it occurs, would certainly be negligible.

Selected References:

*Carney, S. M., M. F. Sorensen, and E. M. Martin. 1975. Distribution in states and counties of waterfowl species harvested during 1961-70 hunting seasons. U. S. Fish and Wildl. Serv. Spec. Sci. Rept. - Wildl. No. 187. 132 pp.

*Stevenson, H. M. 1976. Vertebrates of Florida, identification and distribution. Univ. Presses of Florida, Gainesville. 607 pp.

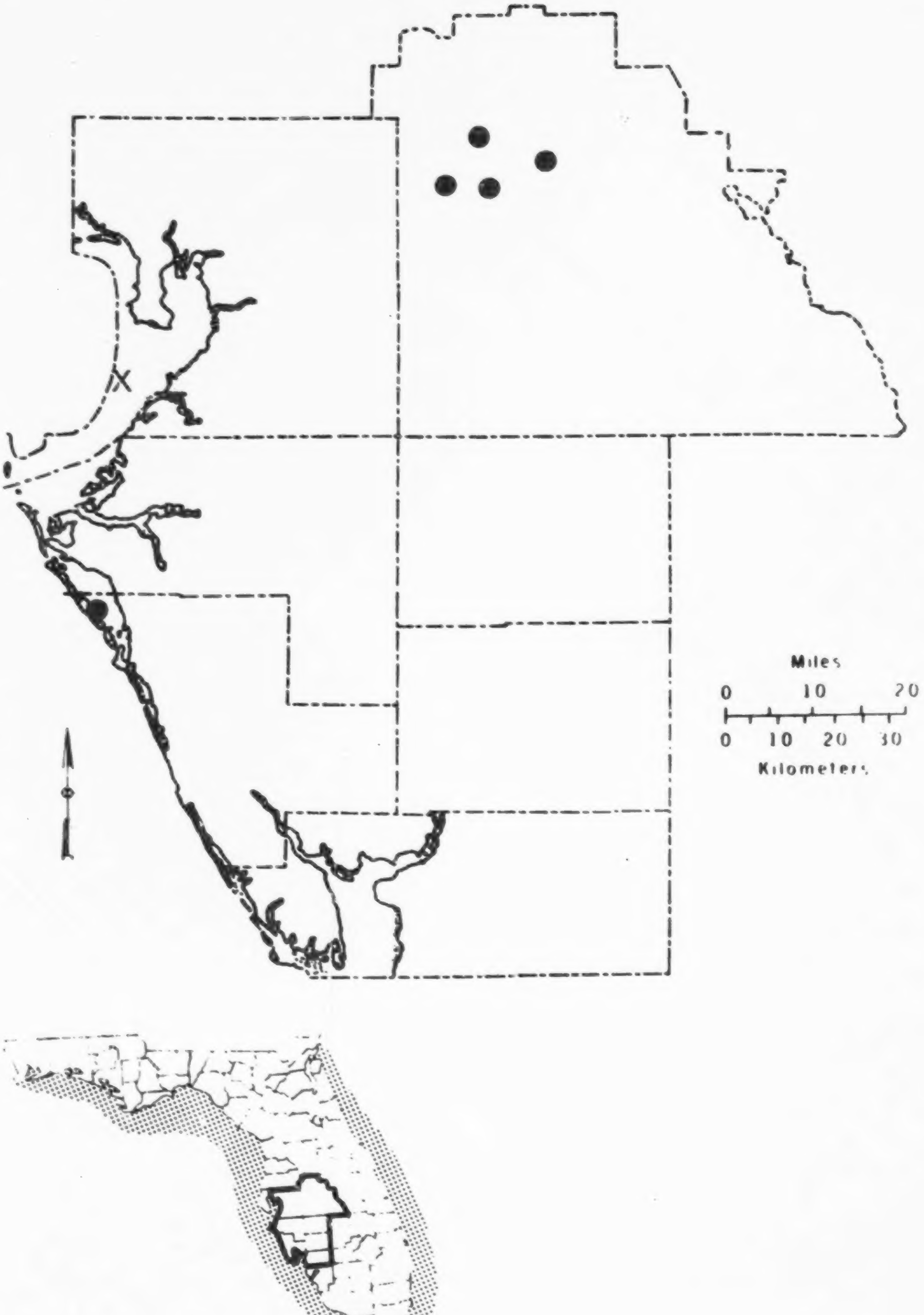
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Fig. VIII.D.56. WHITE-WINGED SCOTER (Melanitta deglandi)

SURF SCOTER Melanitta perspicillata (Linnaeus)

Order Anseriformes Family Anatidae

Distribution: Only two records of the Surf Scoter exist for the seven-county area. One is reported from Terra Ceia Bay, Manatee County (Pitts 1968) and the other from Lakeland, Polk County (Edscorn 1977), both in November. In northern Florida the Surf Scoter occurs from November to March, and rarely into summer. The species breeds from western Alaska throughout northern Canada.

Habitat: The Surf Scoter is primarily a marine bird. However, one of the records from the seven-county area was from a large inland lake (Lake Jessup) in Polk County (J. B. Edscorn pers. comm.).

Population Status: The Surf Scoter is very rare in the study area. Twelve were observed by Pitts (1968) in Terra Ceia Bay and one by Edscorn (1977) in Polk County.

Basis for Priority Status: The Surf Scoter is a game species with a point value of 10 points in the 1976-1977 state hunting regulations.

Potential Impacts of Mining: Because of the rarity of the Surf Scoter in the study area, no impacts of mining on its status in the seven-county area are anticipated. An increase in large slime ponds might increase chances of inland occurrences, but such an effect would be very slight, at most.

Selected References:

*Edscorn, J. B. 1977. Florida birds. Fla. Nat. 50(1):29-30.

*Pitts, C. A. 1968. Surf Scoters, Melanitta perspicillata, on Terra Ceia Bay. Fla. Nat. 41(3):125.

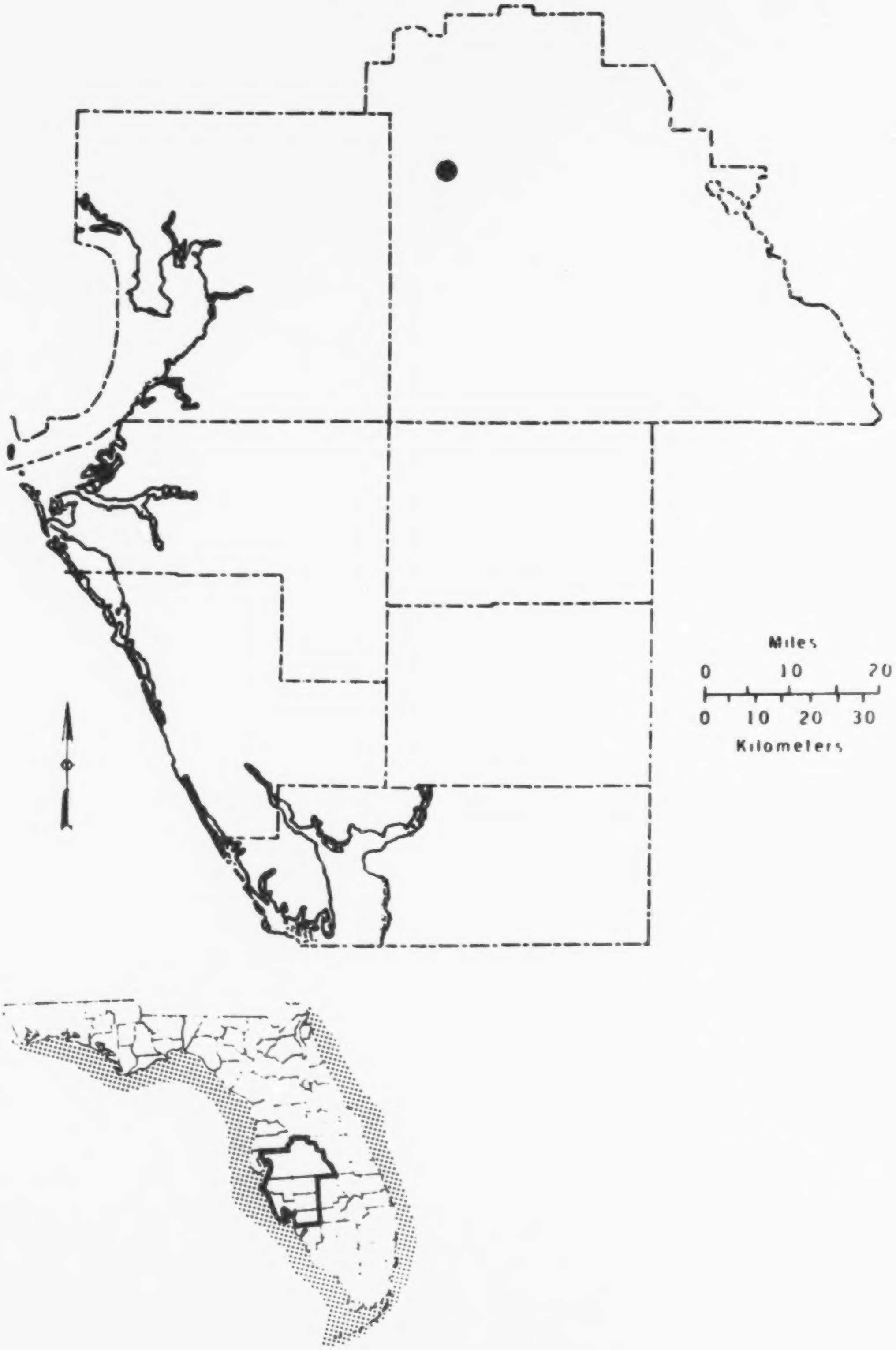
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Fig. VIII.D.57. SURF SCOTER (Melanitta perspicillata)

Game

RUDDY DUCK Oxyura jamaicensis (Gmelin)

Order Anseriformes Family Anatidae

Distribution: Records of the Ruddy Duck in the seven-county area exist for Hillsborough, Manatee, Polk, and Sarasota counties. Sprunt (1954) considered the species abundant in northern Florida, and uncommon in southern Florida. However, in recent years larger numbers of Ruddy Ducks have been reported on the Coot Bay Christmas Bird Count, at the southern tip of the peninsula, than in other parts of the state (Woolfenden and Schreiber 1973). Although nesting records do not exist from the seven-county area, there are a few breeding records in the state, and it is likely that the species occasionally breeds in the seven-county area. This suggestion receives support from a record of 21 individuals seen at Lakeland (Polk County) on 6 July 1968 (Stevenson 1969). J. B. Edscorn (pers. comm.) noted a pair at Orange Park (Polk County) in May and June 1970 that may have nested. The species breeds throughout most of the United States and southern Canada.

Habitat: Within the study area, as in other parts of its range, the Ruddy Duck frequents both fresh and brackish water. Records are most numerous from natural lakes and ponds and phosphate slime ponds. The latter habitats are regularly used by the species (B. Kittleson pers. comm., F. Montalbano pers. comm.). Chamberlain (1960) noted that Ruddy Ducks occasionally occur in the Kissimmee River Valley lakes. The next most frequently recorded habitat is estuaries. These preferences are reflected in local Christmas Bird Counts (Table VIII.D.5) which show the greatest number of Ruddy Ducks recorded from Lakeland, an area in which lakes and slime ponds are abundant. The Lakeland Christmas Bird Counts for the years 1966-1976 average almost five times more Ruddy Ducks per 10 party hours than the Tampa counts, which report the second largest abundance of the species in the area. McKay Bay and various freshwater ponds provide desirable habitats in the Tampa region. The species is rarely seen in coastal marine habitats other than in estuaries. Other habitat records for the Ruddy Duck within the seven-county area include freshwater ponds and ditches in the basins of the Alafia and Little Manatee rivers, Hillsborough County (Dames and Moore 1975).

Population Status: The Ruddy Duck is a common and regular winter resident in the study area, and uncommon in the summer. The species is locally abundant, however; for example, on the 1973-74 Christmas Bird Count, 22,066 were reported from the Lakeland area alone. The 1970-71 Lake Wales count reported a high of 651, while the Tampa count regularly lists from 1770 to 5160, with from 800 to 2000 of these seen at McKay Bay.

Basis for Priority Status: The Ruddy Duck is a game species, with a point value of 25 in the 1976-1977 state hunting regulations. It ranks eleventh of 22 waterfowl species in average annual harvest (251), with 87 percent of the harvest in Polk County (217) and the remainder in Manatee (28) and Hillsborough (6) counties (Carney et al. 1975)

Potential Impacts of Mining: Slime ponds created by mining operations are apparently desirable habitat for Ruddy Ducks, at least in early successional stages. Because of its preferences for lakes and ponds, elimination of natural wetlands (swamps and marshes) by mining probably would not have a deleterious effect on Ruddy Duck populations. The overall impact of mining on the status of this species in the seven-county area would probably be beneficial.

Selected References:

*Carney, S. M., M. F. Sorensen, and E. M. Martin. 1975. Distribution in states and counties of waterfowl species harvested during 1961-70 hunting seasons. U. S. Fish and Wildl. Serv. Spec. Sci. Rept. - Wildl. No. 187. 132 pp.

*Chamberlain, E. B., Jr. 1960. Florida waterfowl populations, habitats and management. Tech. Bull. No. 7. Fla. Game and Fresh Water Fish Comm. Contri. P.R. Proj. W-19-4. 62 pp.

*Dames and Moore. 1975. Hydrobiologic assessment of the Alafia and Little Manatee rivers. Report prep. for the Southwest Fla. Water Management District by Dames and Moore, Consulting Engineers, Atlanta, Georgia.

*Sprunt, A., Jr. 1954. Florida bird life. Coward-McCann, Inc., New York. 527 pp.

*Stevenson, H. M., ed. 1969. Florida's second summer bird count. Fla. Nat. 42(1):22-31.

*Woolfenden, G. E., and R. W. Schreiber. 1973. The common birds of the saline habitats of the eastern Gulf of Mexico: their distribution, seasonal status, and feeding ecology, Pages IIIJ-1 - IIIJ-21 in A summary of knowledge of the eastern Gulf of Mexico 1973. State Univ. System of Fla. Inst. of Oceanography, St. Petersburg, Florida.

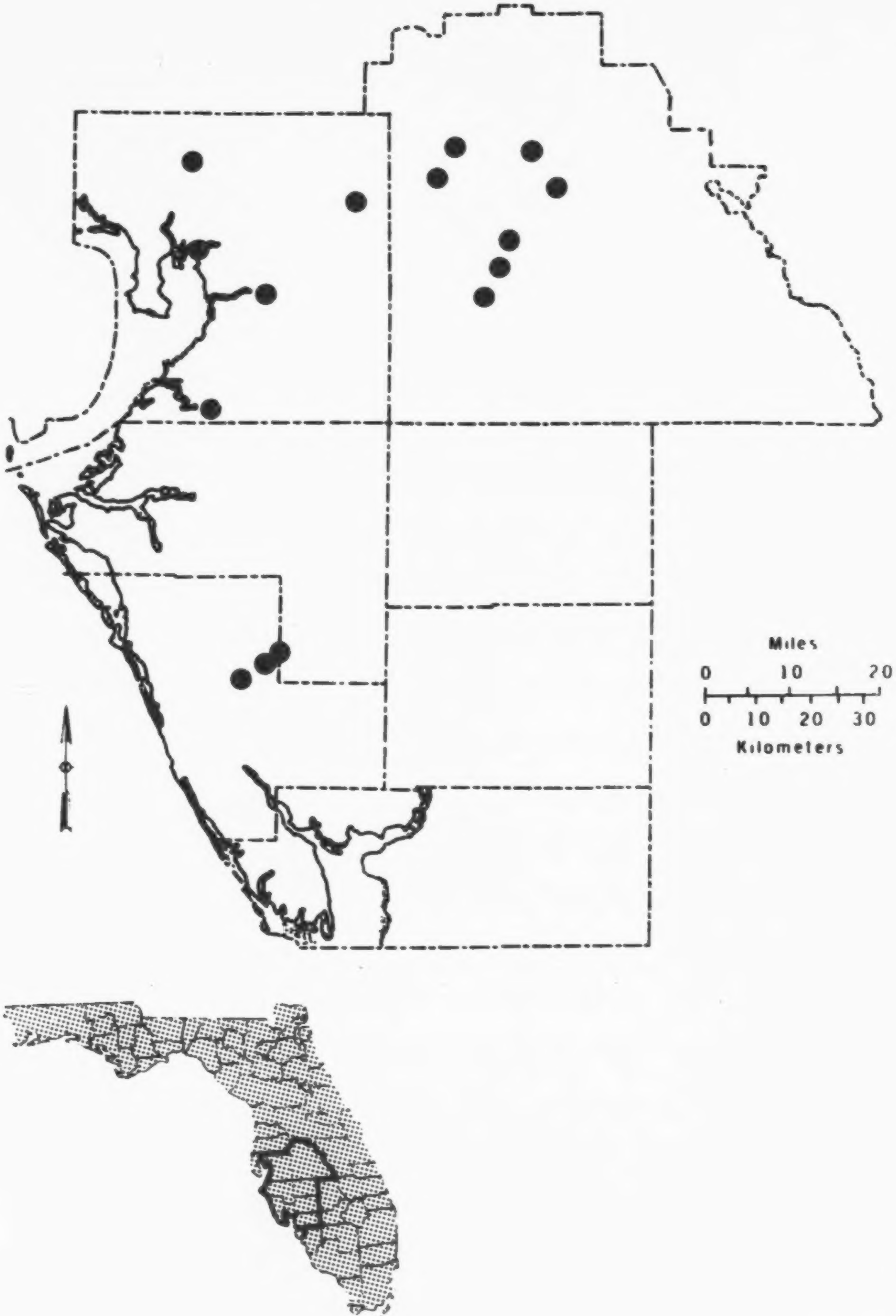
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Fig. VIII.D.58. RUDDY DUCK (Oxyura jamaicensis)

Game

MASKED DUCK | *Oxyura dominica* (Linnaeus)

Order Anseriformes | Family Anatidae

Distribution: The Masked Duck has been recorded only once in the seven-county area, at Lake Morton, Polk County, 3 February 1962 (Funderburg 1962). However, Edscorn (unpubl. MS) places the species on the hypothetical list for the Lake Region. This inconspicuous duck has been sighted irregularly throughout Florida from November to mid-April, with an occasional summer sighting. The species is a resident from the Greater Antilles into South America (Stevenson 1976).

Habitat: The Masked Duck is primarily a freshwater swamp inhabitant. The published record from within the seven-county area was of an individual seen on a lake. In southern Florida records exist from the Loxahatchee National Wildlife Refuge, the northeastern-most extension of the Everglades (Edscorn 1977), and from inland near Naples in Collier County (G. E. Woolfenden pers. comm.).

Population Status: Although the Masked Duck is undoubtedly rare in Florida, its secretive habits may lead to its being overlooked. Thus, it may be a more frequent visitor than available records suggest (Owre 1962). The nine Masked Ducks seen at Loxahatchee from February to mid-April 1977 (Edscorn 1977) and the one specimen obtained from near Naples in June (G. E. Woolfenden pers. comm.), among other records, suggest that the species should be looked for as a possible breeder in Florida.

Basis for Priority Status: The Masked Duck is a game species, with a point value of 10 in the 1976-1977 state hunting regulations.

Potential Impacts of Mining: Given its present apparently rare status, this species would not be affected by mining activities. However, elimination of natural wetlands, particularly swamps, would reduce habitat that could potentially be occupied by the species in the future.

Selected References:

*Edscorn, J. B. Birds of the Lake Region. Unpubl. MS.

*Edscorn, J. B. 1977. Florida birds. Fla. Nat. 50(3):27.

*Funderburg, J. B. 1962. Field notes and observations: Masked Duck (*Oxyura dominica*) at Lakeland. Fla. Nat. 35(3):92.

*Owre, O. T. 1962. The first record of the King Eider, *Somateria spectabilis* (Linnaeus), and the occurrence of other Anseriformes in Florida. Auk. 79:270-271.

*Stevenson, H. M. 1976. Vertebrates of Florida, identification and distribution. Univ. Presses of Fla., Gainesville. 607 pp.

Game

HOODED MERGANSER Lophodytes cucullatus (Linnaeus)

Order Anseriformes Family Anatidae

Distribution: The Hooded Merganser normally is only a winter resident throughout the seven-county area and throughout Florida; it arrives in Florida in November and departs in April for its breeding grounds in the northern and central parts of North America. However, in 1963 an isolated instance of breeding occurred in Hillsborough County (Stevenson 1963).

Habitat: The Hooded Merganser is found most often in woodland ponds and streams. The species may also be found in small borrow pits with emergent vegetation and flooded marshes. Phosphate slime ponds are a favored man-made habitat. Table VIII.D.5 shows Lakeland, an area of lakes and slime ponds, as a center of abundance for the species. Occasionally the species is seen in brackish waters, such as near the mouth of the Peace River in Charlotte County (Hewitt 1976). The breeding record was from a sluggish stream in hydric and mesic hammock.

Population Status: The Hooded Merganser is common and regular in winter in areas of suitable habitat within the seven-county area. As examples, in recent years from 100 to 450 were recorded on four Christmas Bird Counts in the Lakeland area, and from 160 to 200 were recorded on three Christmas Bird Counts in Myakka River State Park. Both of these areas include large tracts of wooded freshwater swamps. The species is less common and irregular on coastal Christmas Bird Counts, with numbers of less than 20 being the norm for years in which they are seen.

Basis for Priority Status: The Hooded Merganser is a game species, with a point value of 70 in the 1976-1977 state hunting regulations. It ranks tenth in average annual harvest (442), with successful hunting in all counties except Manatee: 41 percent and 33 percent taken from Hillsborough (180) and Polk (148) counties, respectively, and 14, 6, 5, and 1 percent taken from DeSoto (60), Charlotte (25), Sarasota (23), and Hardee (6) counties, respectively (Carney et al. 1975).

Potential Impacts of Mining: Elimination of wooded and flooded herbaceous wetlands by mining will reduce the already limited suitable habitat of the Hooded Merganser in the seven-county area, although slime ponds may at least partly compensate for the loss.

Selected References:

*Carney, S. M., M. F. Sorensen, and E. M. Martin. 1975. Distribution in states and counties of waterfowl species harvested during 1961-70 hunting seasons. U. S. Fish and Wildl. Serv. Spec. Sci. Rept. - Wildl. No. 187. 132 pp.

*Hewitt, O. H. 1976. Fieldbook of birds of the Florida suncoast. Mote Marine Lab., Sarasota, Florida. 150 pp.

*Stevenson, H. M. 1963. Florida region. Aud. Field Notes 17(5): 454-457.

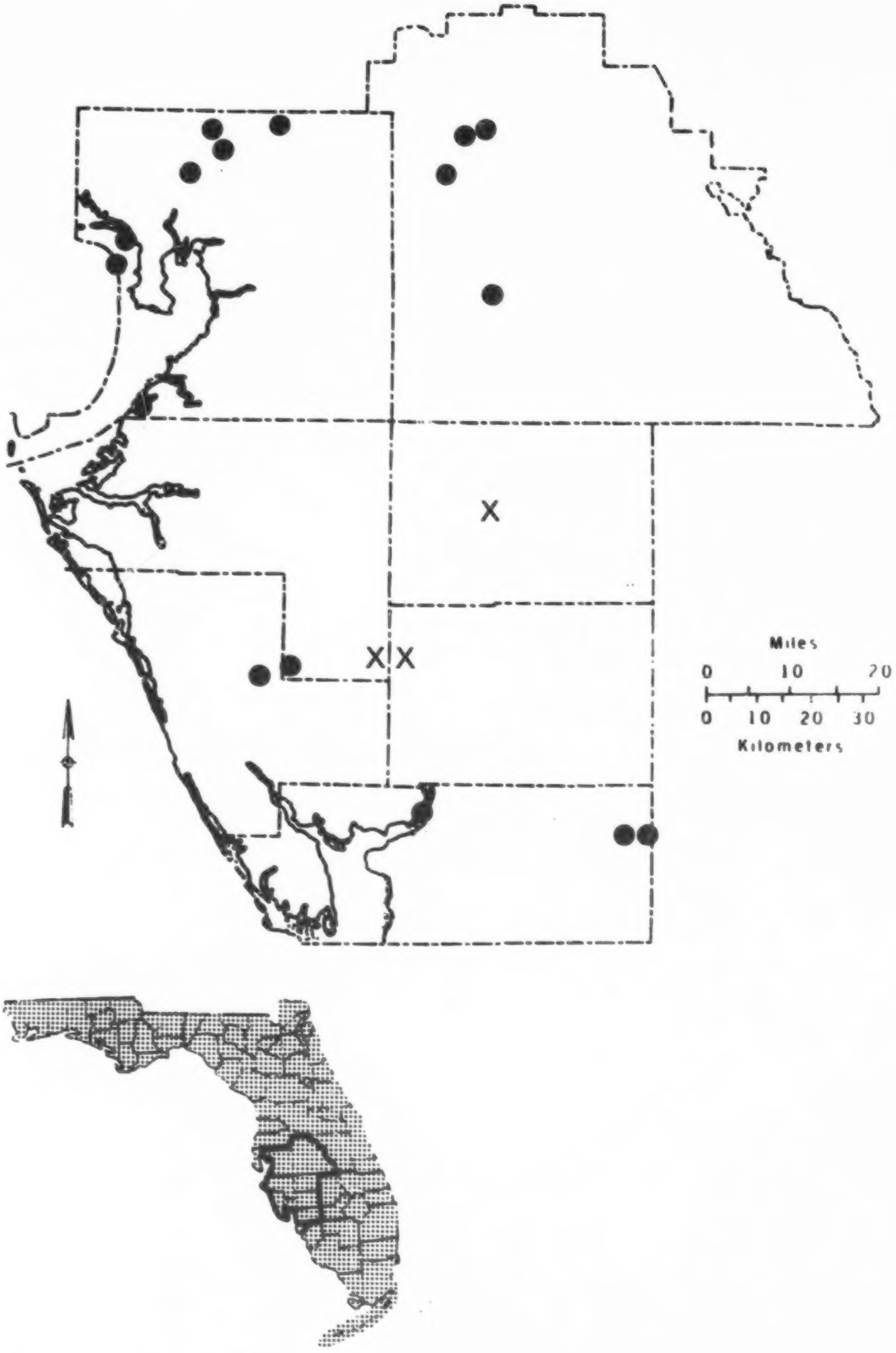
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Fig. VIII.D.59. HOODED MERGANSER (Lophodytes cucullatus)

Game

COMMON MERGANSER   Mergus merganser Linnaeus

Order Anseriformes   Family Anatidae

Other Names: American Merganser

Distribution: Records of the Common Merganser in the seven-county area exist from Charlotte, Hillsborough, Manatee, and Sarasota counties. Although fewer than 1 percent of the mergansers in Florida are of this species (Stevenson 1976), irregular sightings have been recorded throughout mainland Florida from late November to mid-April when the species returns to its breeding grounds farther north on the continent.

Habitat: Records from the seven-county area are all from estuaries. During the winter season in the south, it is found mainly in saltwater bays and estuaries (Howell 1932).

Population Status: Although abundant north of Florida, the Common Merganser is rare and irregular in Florida and especially south of the panhandle. Difficulty in distinguishing this species in the field from female-plumaged Red-breasted Mergansers presents problems in assessing its population status. It is likely that many harvest records of this species (Carney et al. 1975) actually represent the locally abundant Red-breasted Merganser.

Basis for Priority Status: The Common Merganser is a game bird, with a point value of 10 in the 1976-1977 state hunting regulations. All harvest records in the seven-county area are from Hillsborough County, in which an average of 14 were killed from 1961-1970 (Carney et al. 1975).

Potential Impacts of Mining: Because of the rarity of the Common Merganser in the seven-county area, any effects of phosphate mining on the status of the species would be assumed to be negligible.

Selected References:

*Carney, S. M., M. F. Sorensen, and E. M. Martin. 1975. Distribution in states and counties of waterfowl species harvested during 1961-70 hunting seasons. U. S. Fish and Wildl. Serv. Spec. Sci. Rept. - Wildl.No. 187. 132 pp.

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

*Stevenson, H. M. 1976. Vertebrates of Florida, identification and distribution. Univ. Presses of Fla., Gainesville. 607 pp.

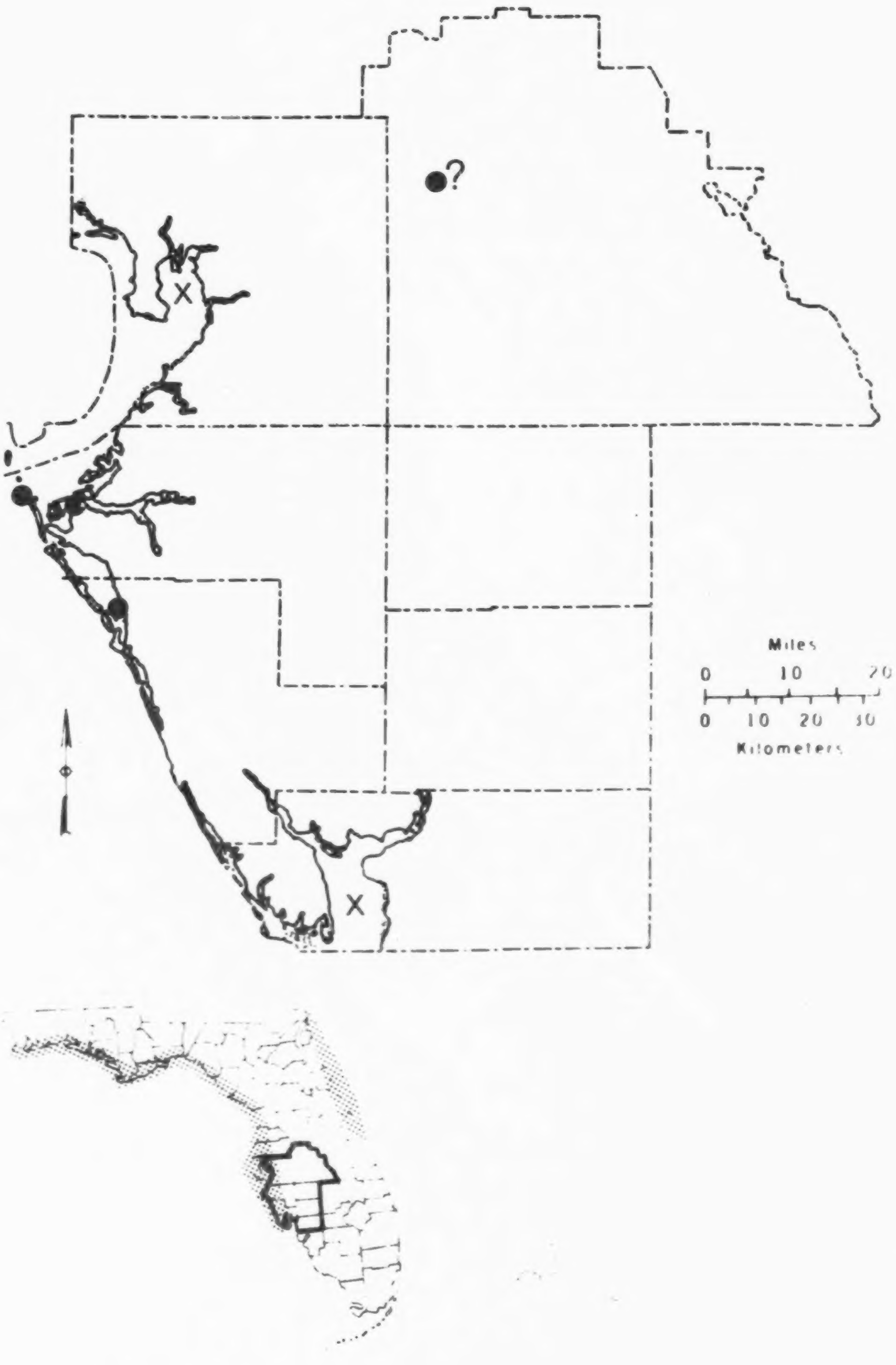
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Fig. VIII.D.60. COMMON MERGANSER (*Mergus merganser*)

Game

RED-BREASTED MERGANSER Mergus serrator Linnaeus

Order Anseriformes Family Anatidae

Distribution: The Red-breasted Merganser is a winter resident in the seven-county area, records existing from all but DeSoto and Hardee counties. It is the most widely distributed duck in the marine habitats of Florida, being found throughout the state and the Keys from late October to May and rarely in summer. It breeds in northern North America.

Habitat: The Red-breasted Merganser is confined almost entirely to salt water. Most records of the species from the seven-county area are from estuaries. Its habitat preference is reflected by the number seen on various local Christmas Bird Counts (Table VIII.D.5). High numbers are regularly recorded on all the coastal counts (Sarasota, Bradenton, Venice, and Tampa) while only low numbers are recorded inland (Lakeland, Lake Wales, and Myakka River State Park). Interior habitats are typically large lakes, although the species occurs rarely in phosphate settling basins and old pits (J. B. Edscorn pers. comm.).

Population Status: In its preferred coastal habitats the Red-breasted Merganser is an abundant and regular winter resident, second only to the Lesser Scaup in abundance in saline environments (Woolfenden and Schreiber 1973). Numbers recorded on coastal Christmas Bird Counts (1966-1976) range from 6 to 103 mergansers per 10 party hours (Table VIII.D.5).

Basis for Priority Status: The Red-breasted Merganser is a game species, with a point value of 10 in the 1976-1977 state hunting regulations. Based on the data of Carney et al. (1975) it ranks seventeenth in average annual harvest (74), with 74 percent taken from Hillsborough County (55) and the rest from Charlotte (19). The relatively low number harvested in the seven-county area reflects its undesirability as a game species rather than its abundance.

Potential Impacts of Mining: Because of the saltwater habitat preferences of the Red-breasted Merganser, inland phosphate mining activities would not affect its status. However, activities associated with mining that would deleteriously impact estuaries could lead to reduction of local populations.

Selected References:

*Carney, S. M., M. F. Sorensen, and E. M. Martin. 1975. Distribution in states and counties of waterfowl species harvested during 1961-70 hunting seasons. U. S. Fish and Wildl. Serv. Spec. Sci. Rept. - Wildl. No. 187. 132 pp.

*Woolfenden, G. E. and R. W. Schreiber. 1973. The common birds of the saline habitats of the eastern Gulf of Mexico: their distribution seasonal status, and feeding ecology, Pages IIIJ-1 - III-21 in A summary of knowledge of the eastern Gulf of Mexico 1973. State Univ. System of Fla. Inst. of Oceanography, St. Petersburg, Florida.

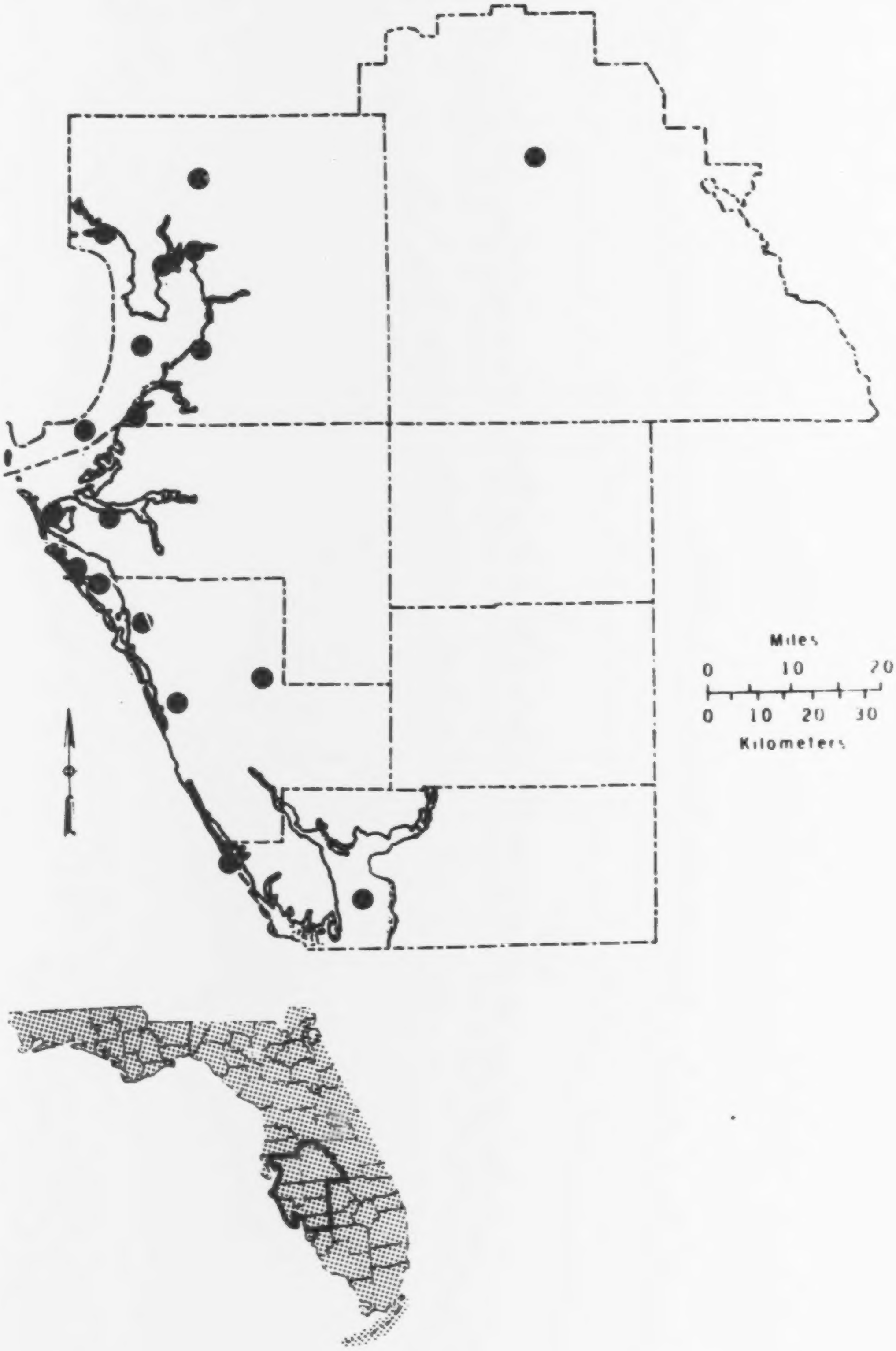
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Fig. VIII.D.61. RED-BREASTED MERGANSER (Mergus serrator)

Biologically Significant

TURKEY VULTURE — Cathartes aura (Linnaeus)

Order Falconiformes — Family Cathartidae

Other Names: Turkey Buzzard

Distribution: The Turkey Vulture is permanently present and generally distributed in the seven-county area. Specific locality records are available for each county. On the basis of available data, there is no indication of seasonal shifts or long-term trends in distribution within the seven-county area. The Turkey Vulture is a permanent resident in the state as far south as Key West (Sprunt 1954). The subspecies occurring over most of the state, including the seven-county area, is C. a. septentrionalis Weid. However, the tropical race, C. a. aura (Linnaeus), has been recorded from extreme southern Florida north at least to Miami (Burleigh 1938). The Turkey Vulture is widely distributed in North America, breeding from the east to west coast and north to southern Michigan, southern Ontario, central New York, southwestern Massachusetts, and Connecticut (AOU 1957).

Habitat: The Turkey Vulture occurs in a wide range of coastal and inland habitats in the seven-county area, as well as elsewhere in Florida. Specific habitats in which the species has been recorded in the subject area include flatwoods, live oak hammocks, mesic hammocks, cypress swamps, mixed hardwood swamps, mangroves, dry brushland, prairies, freshwater marshes, beaches, improved pastures, phosphate-mined lands and interior sand flats, and around artificial ponds, lakes, and canals. In general, Turkey Vultures appear to prefer habitats with open areas rather than continuous forest cover. Suitable roosting and nesting sites are probably key habitat factors. Within the seven-county area, the species has been reported nesting in cypress swamps (Stevenson 1967), and roosts have been observed during the winter months in a hammock adjacent to a swamp in Myakka River State Park (J. N. Layne unpubl. data) and on a radio tower in the city of Tampa (G. E. Woolfenden pers. comm.).

Population Status: The Turkey Vulture is generally common throughout the seven-county area. However, the distribution of records suggests that the species is relatively less frequent on the Lake Wales Ridge than elsewhere in the subject area. This conclusion is supported by the Christmas Bird Count data from the region (Table VIII.D.5). The mean number of individuals per 10 party hours in the Lake Wales and Lakeland areas is 9 compared to values of 9 to 34 (average = 19) for the five counts in other regions. Breeding Bird Surveys (Table VIII.D.7) suggest a higher population level in Manatee and Sarasota counties than in Hillsborough and Polk counties, and the Archbold Biological Station Roadside Censuses (Table VIII.D.9) indicate greater abundance in the areas of DeSoto and Charlotte counties surveyed than that in Hardee. In the latter case, the increased number of vultures is associated with more extensive grassland habitats and cattle ranching. The map of winter populations presented by Bystrak (1974) shows most of the seven-county area included in the 5-20 birds per 10 party hours range, with a small area of Hillsborough County falling in the 1-5 range.

Substantial seasonal differences in population levels are suggested by the available data. Comparison of Christmas Bird Counts and Summer Bird Counts in the Tampa area for 1972-1977 (Table VIII.D.11) shows a mean of

1.3 individuals per 10 party hours in summer and 16.6 in winter. On two of the three segments of the Archbold Biological Station Roadside Censuses, numbers of Turkey Vultures per 100 miles were higher in winter than in summer (Table VIII.D.9). The apparently higher winter population in the seven-county area probably at least partly reflects an influx of northern migrants, although seasonal variations in food supply may also result in local population movements.

The 11-year combined Christmas Bird Count data for the seven-county area as a whole (Table VIII.D.6) show no clear indication of any trend in Turkey Vulture populations from 1966 through 1976. However, counts from Myakka River State Park covering a longer period, 1947-1976, are suggestive of long-term changes in abundance of this species. The mean number of individuals per 10 party hours in nine counts between 1947 and 1957 was 21. An average of 45 birds per 10 party hours was recorded in seven counts from 1958 to 1966, whereas the mean for 10 counts from 1967 to 1976 was 30 per 10 party hours. These figures suggest the population may have been relatively low in the 1940's, built-up during the mid-1960's, and declined to a relatively stable lower level by the late 1960's. The earlier lower level may have resulted from vulture trapping, while the recent reduction may reflect habitat changes.

Basis for Priority Status: As a large scavenger the Turkey Vulture is dependent upon a sufficient source of carrion, which in turn is primarily correlated with land-use practices. For this reason, it can serve as a useful monitor of environmental change.

Potential Impacts of Mining: The status of this species in the seven-county area would probably not be significantly affected by mining or reclamation operations. Increased mortality of small animals resulting directly or indirectly from mining might result in at least a short-term build-up in numbers in mined areas. Reclaimed lands devoted to cattle raising would presumably provide suitable habitat.

Selected References:

*American Ornithologists' Union. 1957. Check-list of North American birds. The Lord Baltimore Press, Baltimore, Maryland. 691 pp.

Bent, A. C. 1937. Life histories of North American birds of prey, order Falconiformes (Part 1). Smithsonian Institution, Washington, D.C. U.S. Nat. Mus. Bull. 167. 409 pp.

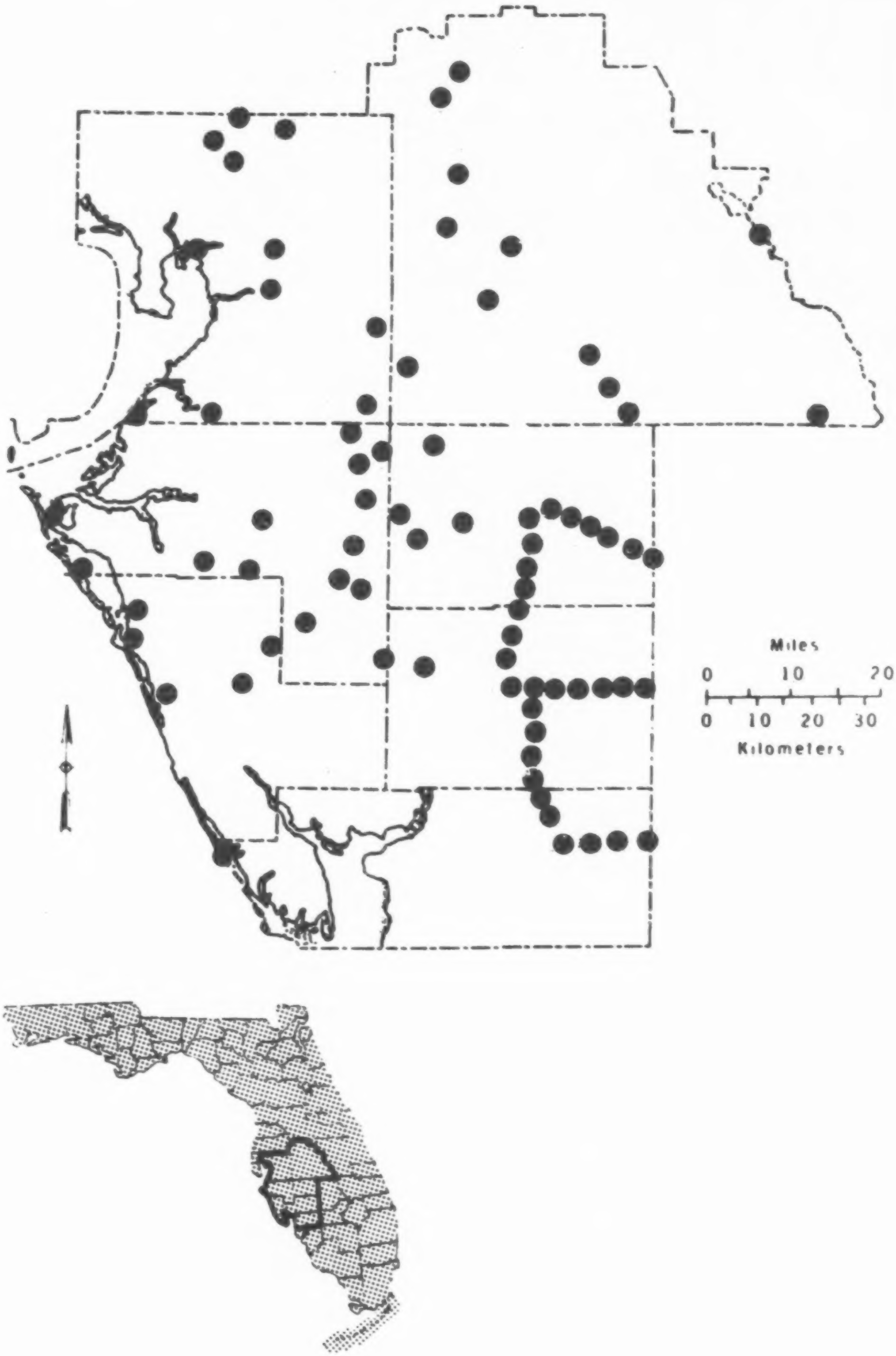
Brown, L., and D. Amadon. 1968. Eagles, hawks, and falcons of the world. McGraw-Hill Book Co., New York. 2 vols.

*Burleigh, T. D. 1938. Mexican Turkey Vulture in southern Florida. Auk 55:520-521.

*Bystrak, D. 1974. Wintering areas of bird species potentially hazardous to aircraft. Nat. Aud. Soc. 156 pp.

*Sprunt, A., Jr. 1954. Florida bird life. Coward-McCann, Inc., New York. 527 pp.

*Stevenson, J. A. 1967. A list of the vertebrates identified in Hillsborough River State Park. Fla. Brd. of Parks. 16 pp.


Miles
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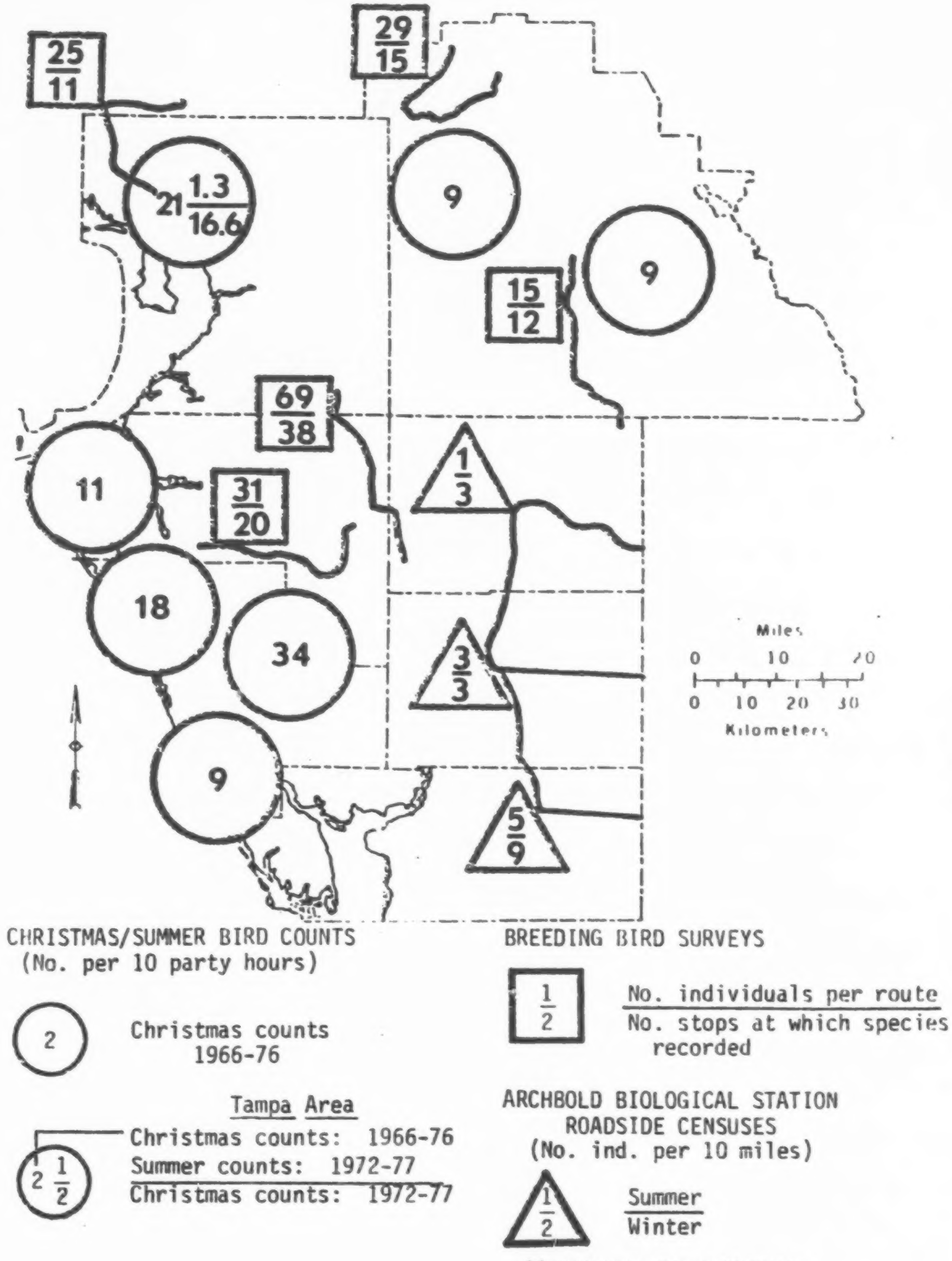
Kilometers

Fig. VIII.D.62. TURKEY VULTURE (Cathartes aura)


25/11
29/15
21 1.3/16.6
9
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15/12
69/38
11
31/20
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18
34
3/3
9
5/9
Miles
0 10 20
0 10 20 30
Kilometers
CHRISTMAS/SUMMER BIRD COUNTS
(No. per 10 party hours)
2 Christmas counts 1966-76
Tampa Area
Christmas counts: 1966-76
Summer counts: 1972-77
Christmas counts: 1972-77
2 1/2
BREEDING BIRD SURVEYS
1/2
No. individuals per route
No. stops at which species recorded
ARCHBOLD BIOLOGICAL STATION
ROADSIDE CENSUSES
(No. ind. per 10 miles)
1/2
Summer
Winter
X SPECIES NOT CENSUSED

Fig. VIII.D.63. TURKEY VULTURE (*Cathartes aura*). Population data.

Biologically Significant

BLACK VULTURE *Coragyps* *atratus* (Bechstein)

Order Falconiformes Family Cathartidae

Other Names: Black Buzzard

Distribution: The Black Vulture is permanently present throughout the seven-county area, with specific records available for each county. It occurs as a permanent resident throughout the state, but is less frequent in the extreme southern portion. Robertson and Kushlan (1974) state that it does not occur in the Florida Keys, although Sprunt (1954, 1963) cites occasional records. Stevenson (1976) remarks that it is absent or casual on the Keys. The Black Vulture has a more restricted North American range than the Turkey Vulture, occurring in the southern United States north to southern Illinois, Indiana, and Ohio and West Virginia and Maryland in the east and to southern Arizona, northern Mexico, western Texas, eastern Oklahoma, and in southeastern Kansas in the west (Stevenson 1976).

Habitat: This species occurs in a wide range of habitat types but appears to be more oriented to open grassland areas than the Turkey Vulture and thus somewhat more habitat specific. Habitats in which it has been recorded in the seven-county area include flatwoods, live oak hammocks, mixed hardwood swamps, cypress swamps, grasslands, beaches, phosphate-mined lands, and around ponds, lakes, rivers, coastal areas, and artificial bodies of water. Wooded areas are of importance to the species for roost sites. Known roosts within the seven-county area in recent years were located at Nature's Classroom on the Hillsborough River (Hillsborough County) and near Deer Prairie Slough in Myakka River State Park (J. N. Layne unpubl. data).

The roost at the first locality had a maximum of about 1500 individuals during the winter months (W. Ackerman pers. comm.). Suitable nesting cover in the form of dense clumps of palmetto or other vegetation is also an important habitat variable.

Population Status: The Black Vulture is generally common throughout the seven-county area. Available data do not indicate any major regional differences in abundance, although general observations suggest that Black Vultures are less common on the Lake Wales Ridge area as compared with the lowlands to the west and east. There is also some indication from the Christmas Bird Counts that the species is relatively more abundant in the interior than along the coast.

In those parts of the study area for which seasonal data are available, there is a strong indication that Black Vultures are more numerous in winter than summer. In the Tampa region, the mean numbers of individuals per 10 party hours in summer and winter over the period 1972-1977 were 1.2 and 2.7, respectively (Table VIII.D.11). The Archbold Biological Station Roadside Censuses from 1974 to 1977 (Table VIII.D.9) also indicate a winter increase in this species in those parts of Hardee, DeSoto, and Charlotte counties surveyed. The apparent increase in the winter population may be due to southward movement of individuals from more northerly parts of the species' range.

The combined Christmas Bird Count data from four areas within the seven-county area for the 11-year period 1966-1976 show no clear indication of any general trend in abundance (Table VIII.D.6). Myakka River State Park counts from 1947 through 1976 do, however, suggest that the population in this region was lower in the late 1940's to mid-1950's than at present. In the period 1947 to 1956, five of seven counts ranged from 11 to 20 individuals per 10 party hours, whereas from 1957 to 1976 only one of 18 counts fell below 20 birds per 10 party hours and the population appears to be relatively stable. It is possible that lower populations in the earlier period were the result of vulture control activities. More intensive cattle ranching in the region and reduced persecution may have contributed to maintenance of a relatively high and stable population in recent years.

Basis for Priority Status: The Black Vulture is dependent upon carrion for survival and the amount and type of carrion available is tied to habitat and land-use practices. Thus, the species is a useful indicator of environmental conditions. The Black Vulture is somewhat more specialized in its feeding behavior than the Turkey Vulture, tending to feed on larger animals and feeding in larger, more social groups. This, plus the fact that it has a more limited range in North America, suggests that it may be a more sensitive indicator of environmental change than the Turkey Vulture.

Potential Impacts of Mining: The status of the Black Vulture in the seven-county area would probably not be severely altered by mining or reclamation operations as long as sufficient areas of undisturbed habitat remained in the general region. Being highly mobile, populations can easily shift in response to local factors. Areas reclaimed to improved pastures and cattle raising could result in increased abundance of the species.

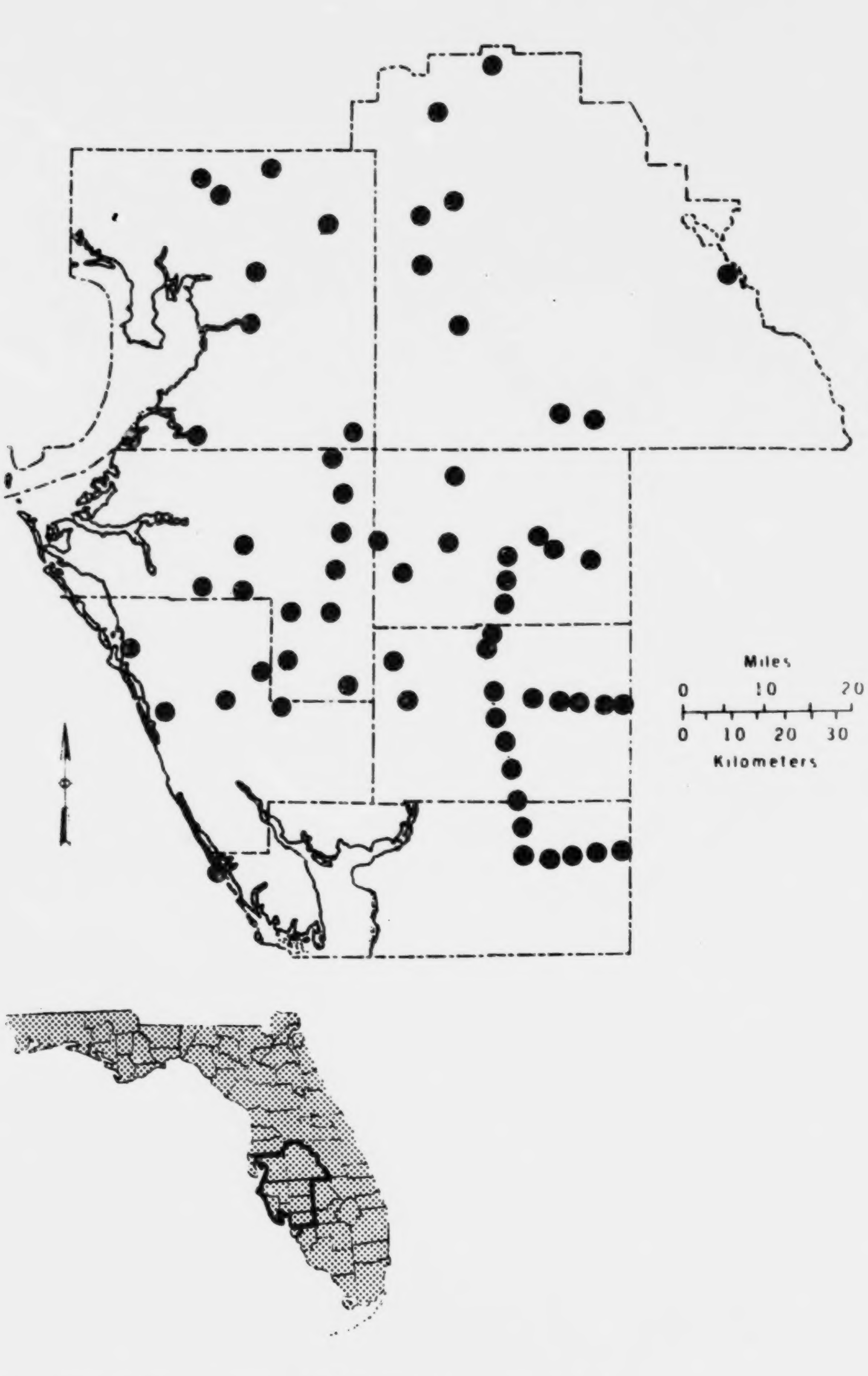
Selected References:

*Robertson, W. B., Jr., and J. A. Kushlan. 1974. The southern Florida avifauna, Pages 414-452 *in* Gleason, P. J., ed., Environments of south Florida: present and past. Miami Geol. Soc. Memoir 2. 452 pp.

*Sprunt, A., Jr. 1954. Florida bird life. Coward-McCann, Inc., New York. 527 pp.

*Sprunt, A., Jr. 1963. Addendum to Florida Bird Life. Coward-McCann, Inc., New York. 21 pp.

*Stevenson, H. M. 1976. Vertebrates of Florida, identification and distribution. Univ. Presses of Fla., Gainesville. 607 pp.


Miles
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Kilometers

Fig. VIII.D.64. BLACK VULTURE (*Coragyps atratus*)

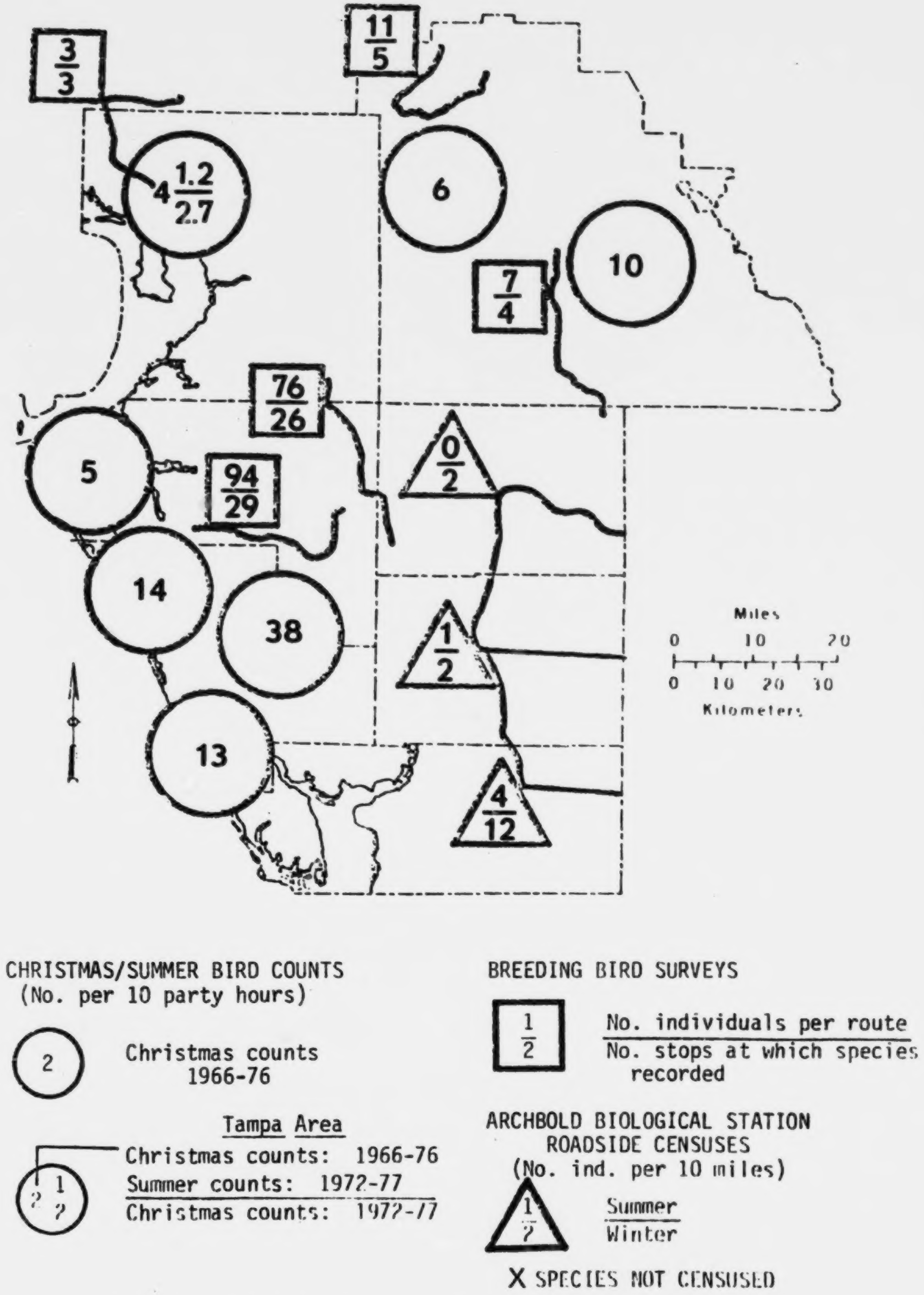

3/3
11/5
4 1.2/2.7
6
10
7/4
76/26
5
94/29
0/2
14
38
1/2
13
4/12
Miles
0 10 20
0 10 20 30
Kilometers
CHRISTMAS/SUMMER BIRD COUNTS
(No. per 10 party hours)
2
Christmas counts 1966-76
Tampa Area
Christmas counts: 1966-76
Summer counts: 1972-77
Christmas counts: 1972-77
2 1/2
BREEDING BIRD SURVEYS
1/2
No. individuals per route
No. stops at which species recorded
ARCHBOLD BIOLOGICAL STATION ROADSIDE CENSUSES
(No. ind. per 10 miles)
1/2
Summer
Winter
X SPECIES NOT CENSUSED

Fig. VIII.D.65. BLACK VULTURE (*Coragyps atratus*). Population data.

Listed - Rare

WHITE-TAILED KITE *Elanus leucurus majusculus* Bangs and Penard

Order Falconiformes Family Accipitridae

Other Names: The scientific name as given above appears in the American Ornithologists' Union Check-list (1957). Parkes (1958) proposed the combination *E. caeruleus majusculus*; Brown and Amadon (1968), however, continue to use the name *E. leucurus* for this species.

Distribution: The White-tailed Kite has been recorded from four counties (Hillsborough, Manatee, Polk, Sarasota) of the seven-county area. The most recent sightings within the area have been reported from Manatee County in 1963, Polk County in 1961 and 1963, and Sarasota County in 1970 (Kale 1974). There appears to be no distinct seasonal trend in sightings. Of five records for which the month is given, there is one each in February, March, May, October, and November. This species is of sporadic occurrence elsewhere in peninsular Florida. Kale (1976) mapped state records from 1872 through 1972. Of 12 reports from 1950 to 1972, only one (8 percent) is from a locality north of Polk County. Four (22 percent) of 18 older records (1872-1950) are north of Polk County, in St. Johns and Volusia counties. The main Florida range appears to be the prairie - pasture regions in the south- and west-central part of the peninsula. Outside Florida, *E. l. majusculus* is resident in California, Oklahoma, and Texas and southward into Central America and casual in Oregon, Louisiana, southern Illinois, and Massachusetts (AOU 1957). Eisenmann (1971) noted an increase in its range in recent years.

Habitat: The White-tailed Kite occurs in "partly open country with scattered trees and streams or freshwater marshes and irrigated agricultural lands" (Kale 1976). One of the individuals recorded in the seven-county area was observed over a wet meadow (Kale 1974).

Population Status: The White-tailed Kite is extremely rare in the seven-county area as well as the state as a whole, although the frequency of sightings has increased since the 1960's. However, no nesting has been reported since 1910 (Kale 1976). Howell (1932) notes a nesting record near Sarasota in 1872. Based on records summarized by Kale (1976), the seven-county area is a relatively important part of the Florida range, with 2 (17 percent) of 12 recent records and 8 (27 percent) of all (30) records.

Basis for Priority Status: The species is listed as Rare by the Florida Committee on Rare and Endangered Plants and Animals on the basis of its extreme scarcity in the state.

Potential Impacts of Mining: From a practical standpoint there seems to be little basis for concern about the possible impacts of mining and reclamation activities on the White-tailed Kite because of its rarity in the seven-county area. However, destruction of grassland habitats and natural marshes during actual mining and subsequent reclamation to unnatural types of habitats would diminish potential habitat for this species and thereby perhaps diminish possibilities of any future increase in the population.

Selected References:

*American Ornithologists' Union. 1957. Check-list of North American birds. The Lord Baltimore Press. Baltimore, Maryland. 691 pp.

*Brown, L., and D. Amadon. 1968. Eagles, hawks and falcons of the world. McGraw-Hill Book Co., New York. 2 vols.

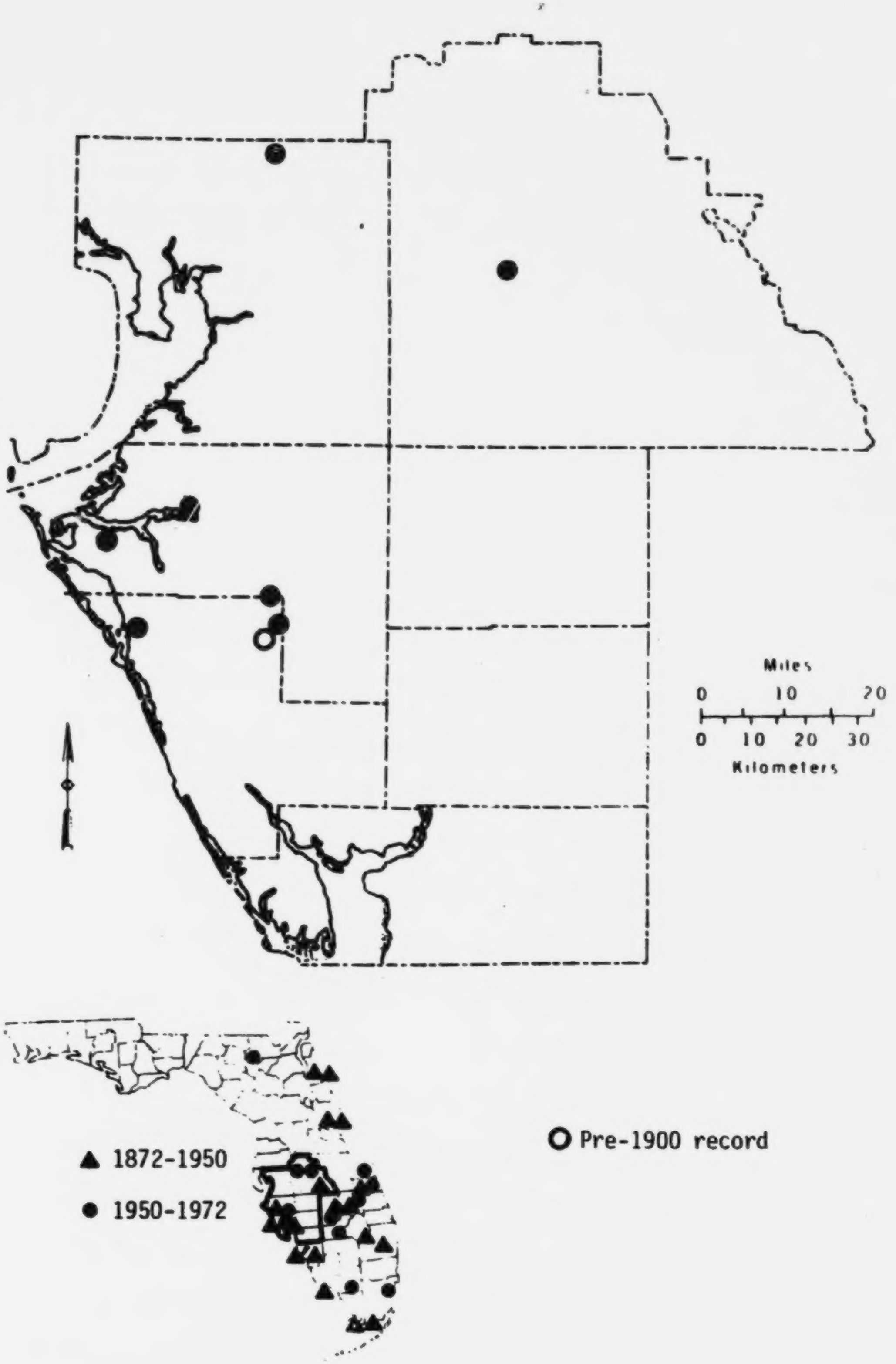
*Eisenmann, E. 1971. Range expansion and population increase in North and Middle America of the White-tailed Kite (_Elanus leucurus_). Am. Birds 25(3):529-536.

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

*Kale, H. W., II. 1974. The status of the White-tailed Kite in Florida. Fla. Field Nat. 2(1):4-7.

*Kale, H. W., II. 1976. White-tailed Kite, Pages 806-810 _in_ Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

*Parkes, K. C. 1958. Specific relationships in the genus _Elanus_. Condor 60:139-140.


Miles
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Kilometers
O Pre-1900 record
▲ 1872-1950
● 1950-1972

Fig. VIII.D.66. WHITE-TAILED KITE (*Elanus leucurus majusculus*)

Biologically Significant

SWALLOW-TAILED KITE — *Elanoides forficatus* (Linnaeus)

Order Falconiformes — Family Accipitridae

Distribution: The Swallow-tailed Kite is a summer resident in the seven-county area and is generally distributed throughout the area. Actual records are available for all counties. Dates of sightings or other records for the seven-county area extend from late February through late September. The breeding range of this species in Florida encompasses most of the state, with the exception of the outer Keys and extreme northwest Florida (Stevenson 1976). It is most abundant in the central and southern regions. Some birds may remain in extreme southern Florida during the winter, but the bulk of the population migrates farther south, presumably to South America. Observations in south-central Florida (Highlands and Glades counties) suggest that Kites begin to shift southward in the state by mid-summer after breeding is over (J. N. Layne unpubl. data). The over-all breeding range of the Swallow-tailed Kite extends from central and southern Texas eastward along the northern Gulf coast to South Carolina and Georgia and southward to central Argentina. Swallow-tailed Kites formerly bred north to Minnesota and Nebraska, and the breeding range is apparently expanding northward at present (Stevenson 1976).

Habitat: Its preferred habitat in the seven-county area and elsewhere in the state consists of mixed pinelands, hammocks, or swamps, and open grassland or marshy areas. Specific habitat types recorded in the seven-county area include cabbage palm hammocks, live oak hammocks, mixed hardwood swamps, cypress swamps, mangrove swamps, freshwater marshes, and wooded, thinly settled areas. Suitable nest sites as well as good foraging areas are important habitat variables. The kites usually nest in the tops of tall pines or cypress trees in or near swamps, although in coastal regions mangroves may be utilized (Howell 1932).

Population Status: The Swallow-tailed Kite appears to be generally rare in the seven-county area even in areas of apparently suitable habitat. For example, it is regarded as a very rare visitor in Hillsborough River State Park (Stevenson 1967) and an uncommon migrant at Myakka River State Park (Fla. Dept. Nat. Res. 1976), both of which areas seemingly provide good potential kite habitat. Robertson and Kushlan (1974) also noted that this species does not breed in all areas of suitable habitat in southern Florida.

There appear to be no verified nesting records for the seven-county area. Possible nesting was reported by "W.A.M." (1882) in Tampa, Hillsborough County, in 1882; in DeSoto County in 1922 (Evans 1923); and, more recently, in northern Polk County in 1970 (Robertson 197^{0}), and in Polk County in 1975 and 1976 (Edscorn 1975, 1976). With regard to long-term population trends, Chamberlain (1976) indicates there has been a decline in the species due to some unknown factor. The species was apparently not a common breeder even in earlier years, according to the map in Howell (1932). J. B. Edscorn (pers. comm., Ogden 1975) noted that Swallow-tailed Kites have probably very slowly increased in the Green Swamp region of Polk County in recent years. A late season record (20 September) obtained by John Edscorn in northern Polk County in 1971 suggested nesting might have occurred in that region for the first time in recent memory (Robertson 1971).

Basis for Priority Status: The Swallow-tailed Kite is included as a priority species because of its rarity in the seven-county area and significance as an indicator of the quality of the hammock-swamp habitat types with which it is associated.

Potential Impacts of Mining: Elimination or degradation of cabbage palm hammocks, bayheads, cypress and other types of swamps, and mature pine stands by mining and the replacement of these natural associations by unsuitable environments in reclamation would have a potentially negative impact on Swallow-tailed Kites in the seven-county area. Even if an attempt was made to recreate suitable habitats in reclaimed areas, the long period of time required for the growth of trees would slow the process of repopulation of mined areas. However, considering the present scarcity of the species in the region, it seems unlikely that mining would have a significant impact on the status of the species in the region or state as a whole.

Selected References:

*Chamberlain, E. B. 1976. Rare and endangered birds of the southern national forests. U. S. Dept. of Agriculture, Forest Serv. Southern Region. 108 pp.

*Edscorn, J. B. 1975. Avian highlights of the year. Lake Region Nat. Fall-Winter 1975-1976. pp. 10-12.

*Edscorn, J. B. 1976. Avian highlights of the year. Lake Region Nat. 1976-77. pp. 17-19.

*Evans, L. I. 1923. An annotated list of birds observed in south Florida. Oologist 40:2-8.

*Florida Department of Natural Resources. 1976. Vertebrates of Myakka River State Park. 26 pp.

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

*M., W. A. 1882. Swallow-tailed Hawk in Florida. Forest and Stream. 19:127.

*Ogden, J. C. 1975. Florida region. Am. Birds 29(5):960-963.

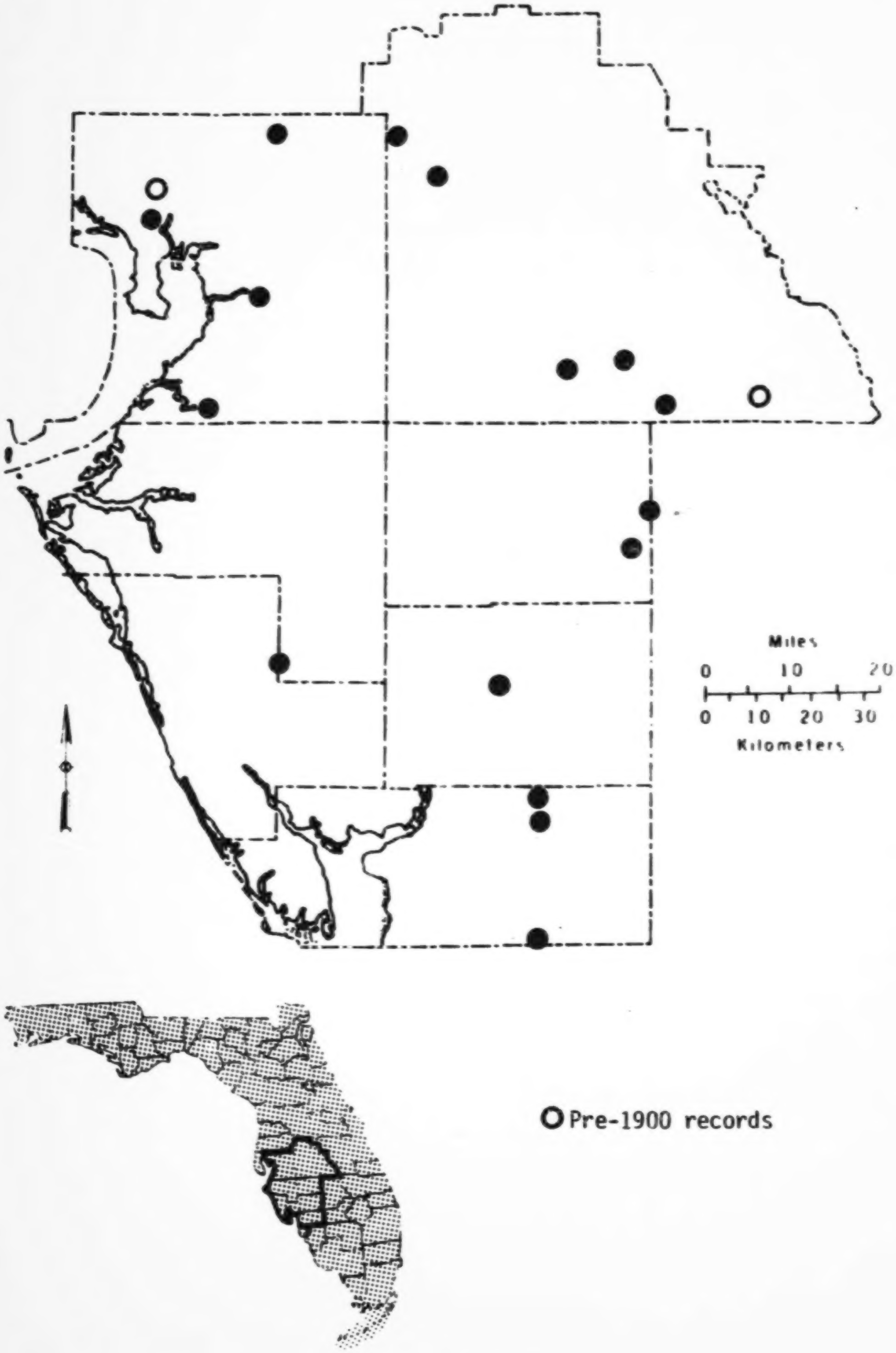
*Robertson, W. B., Jr. 1971. Florida region. Am. Birds 25(1):44-49.

*Robertson, W. B., Jr., and J. A. Kushlan. 1974. The southern Florida avifauna, Pages 414-452 _in_ Gleason, P. J., ed., Environments of south Florida: present and past. Miami Geol. Soc. Memoir 2. 452 pp.

Snyder, N. F. R. 1975. Breeding biology of Swallow-tailed Kites in Florida. The Living Bird 13:73-98.

*Stevenson, H. M. 1976. Vertebrates of Florida, identification and distribution. Univ. Presses of Fla., Gainesville. 607 pp.

*Stevenson, J. A. 1967. A list of the vertebrates identified in Hillsborough River State Park. Fla. Brd. of Parks. 16 pp.


Miles
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Kilometers
○ Pre-1900 records

Fig. VIII.D.67. SWALLOW-TAILED KITE (Elanoides forficatus)

Biologically Significant

MISSISSIPPI KITE *Ictinia mississippiensis* (Wilson)

Order Falconiformes Family Accipitridae

Distribution: The Mississippi Kite is apparently only a rare winter visitant or migrant in the seven-county area. The only recent record from the area is a sighting just north of Lake Hatchineha, Polk County, in January 1965 (Heinzman and Heinzman 1965). The species has also been recorded a few miles south of the seven-county area (specimen No. 470054 in the American Museum of Natural History collection, collected at "Corra [= Cayo?] Costa Key, Charlotte [presently Lee] County" on 16 April 1875). In his range map for this species, Howell (1932) shows a locality record on the Kissimmee River south of Lake Kissimmee, but it is not clear whether it is in Polk or Osceola county.

Over the state as a whole, the Mississippi Kite is considered an uncommon migrant and summer resident in northern Florida and a very rare migrant and winter resident in the central and southern region. The southernmost recorded breeding locality was allegedly on the Caloosahatchee River (Howell 1932). However, the main breeding range outlined by Howell (1932) was west of the St. Marks River (Wakulla County). Robertson and Kushlan (1974) noted that the breeding range had spread into the northern peninsula, with nesting south to at least Gainesville (Alachua County). This species is a local breeder in the United States from Kansas eastward through Iowa, Tennessee, and South Carolina and south along the Gulf coast from Florida to eastern Texas. It formerly extended north in the Mississippi Valley to southern Illinois and Indiana. It is strongly migratory, probably normally wintering in South America (Brown and Amadon 1968). There is an indication that the species is expanding northward and westward in recent years (Stevenson 1976).

Habitat: The individual observed by Heinzman and Heinzman (1965) within the seven-county area was in an area of pasture and palmettos. Howell (1932) described the Florida habitat of this species as "wooded regions, often around the borders of heavy bottom-land timber." Nests are usually built in tall forest trees usually from 50 to 75 feet, but sometimes as high as 100 feet. Pines are frequently used (Howell 1932).

Population Status: This species is extremely rare in the seven-county area and there is apparently no regular migrant population. Sprunt (1954) believed it was somewhat more regular in its breeding range in the Florida panhandle than Howell (1932) indicated. There is no clear evidence that the numerical status of the Mississippi Kite in Florida has changed significantly over the past 50 years, although a slight increase may have occurred.

Basis for Priority Status: The species is listed as biologically significant because of its rarity in the seven-county area and rather specific preference for rather heavily timbered habitats, which are few in the seven-county area.

Potential Impacts of Mining: Because of the very infrequent and irregular occurrence of the Mississippi Kite in the seven-county area there is no reason to anticipate any significant impact on its status within the study area or state as a whole as the result of mining activities except to point out that destruction of tall timber stands by mining would diminish potential habitats for the species. However, whether or not these would ever be occupied in the absence of mining is unknown.

Selected References:

*Brown, L., and D. Amadon. 1968. Eagles, hawks and falcons of the world. McGraw-Hill Book Co., New York. 2 vols.

*Heinzman, D. B., and G. M. Heinzman. 1965. Mississippi Kite (*Ictinia mississippiensis*) seen in Polk County. Fla. Nat. 38(2):60.

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

*Robertson, W. B., Jr., and J. A. Kushlan. 1974. The southern Florida avifauna, Pages 414-452 *in* Gleason, P. J., ed., Environments of south Florida: present and past. Miami Geol. Soc. Memoir 2. 452 pp.

*Sprunt, A., Jr. 1954. Florida bird life. Coward-McCann, Inc., New York. 527 pp.

*Stevenson, H. M. 1976. Vertebrates of Florida, identification and distribution. Univ. Presses of Fla., Gainesville. 607 pp.

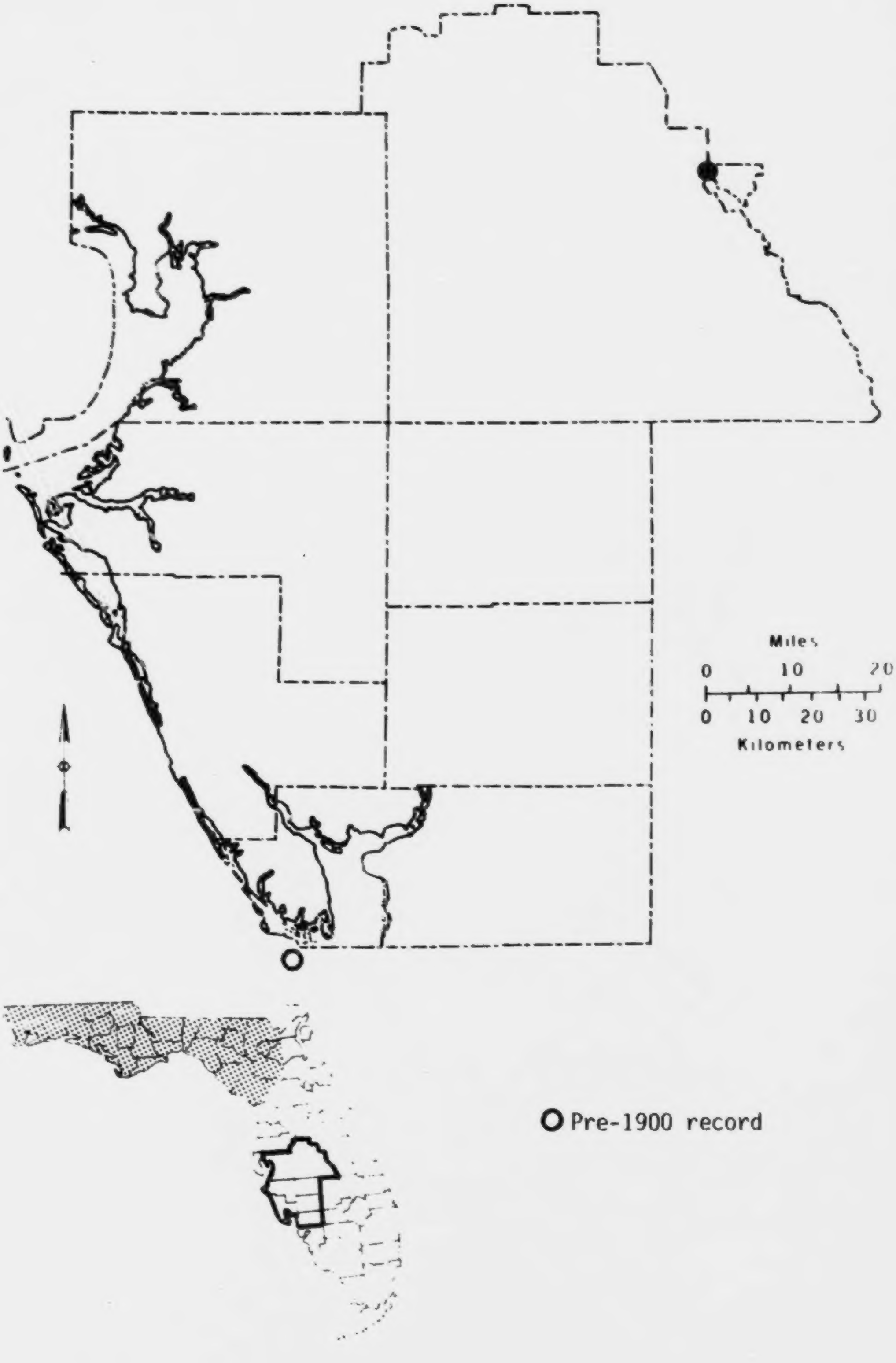
Miles
0 10 20
0 10 20 30
Kilometers
○ Pre-1900 record

Fig. VIII.D.68. MISSISSIPPI KITE (*Ictinia mississippiensis*)

Breeding range

Listed - Endangered

FLORIDA EVERGLADE KITE | *Rostrhamus sociabilis plumbeus* Ridgway

Order Falconiformes | Family Accipitridae

Other Names: Snail Kite, Snail Hawk. Brown and Amadon (1968) considered this and other described subspecies of the species to be doubtfully distinct.

Distribution: The Florida Everglade Kite occurs in the seven-county area as an occasional transient. There appear to be no recent or historical records of nesting in the area. Actual records are available for four (DeSoto, Manatee, Polk, Sarasota) of the seven counties, as follows:

DeSoto County: no other locality. 2 specimens in the British Museum (Natural History) collected 8 March 1888 (P. W. Sykes pers. comm.)

Manatee County: no other locality. 1 specimen in the Museum of Comparative Zoology collected 19 December 1886 (P. W. Sykes pers. comm.); no other locality. 1 specimen in the Field Museum collected 20 December 1886 (P. W. Sykes pers. comm.).

Polk County: Lake Kissimmee, late May 1973 (J. Carroll to P. W. Sykes pers. comm.); south shore of Lake Arbuckle 27 May 1971 (Wilson 1971). Questionably Avon Park Bombing Range (McMarrell and Ebersbach unpubl. MS).

Sarasota County: Sarasota, 20-27 November 1954 (Stevenson 1955); Myakka River State Park, 26 February 1969 (W. J. Kenner to P. W. Sykes pers. comm.).

This species formerly occurred over most of peninsular Florida where suitable habitat was found. Breeding populations are presently restricted to several impoundments on the upper St. Johns River, parts of Lake

Okeechobee, and portions of Conservation Areas 1 (Loxahatchee National Wildlife Refuge), 2A, 2B, 3A, and 3B, and the northern part of Everglades National Park. Transient individuals have been recorded at other localities (Sykes 1976).

The subspecies R. s. plumbeus is restricted to Florida. The species as a whole ranges from southern Florida, Cuba, the Isle of Pines, and eastern Mexico (Veracruz) south through Central America and most of South America, excluding the southern and western parts (Brown and Amadon 1968).

Habitat: This species is narrowly confined to freshwater marshes. Specific habitat requirements include a distant horizon and low vegetative profile, with extensive areas of shallow (4 feet or less) relatively open areas of permanent water and scattered shrubs or small trees for perching and nest sites (Sykes 1976). This kite is almost entirely dependent upon the Apple Snail (Pomacea paludosa) for food and thus its presence in an area is dependent upon the abundance and availability of the Snail. The kite forages in relatively open areas with a minimum of emergent vegetation (Snyder and Snyder 1969).

Population Status: There is apparently no established population of this species within the seven-county area and there do not appear to be any potential habitats of sufficient extent to support a significant number of birds. Statewide the population has experienced a drastic long-term decline. Howell (1932) noted the restriction of the breeding range in the Everglades due to drainage. In 1954, Sprunt (1954) estimated that the population had declined to between 50 and 75 individuals, and nine years later he stated that "hardly more than half a dozen birds" remained in Florida. Stieglitz and Thompson (1967) gave 20 as the minimum number of kites in 1966. In December 1973, the population was estimated at slightly over 100 individuals (Sykes 1976). The decline of this species is attributed primarily to widespread drainage and other deleterious effects on marshes by human activities. Water hyacinths (_Eichornia crassipes_) have also reduced the suitability of some potential kite habitats by covering the water surface and making it difficult for kites to locate snails. Shooting of kites, particularly by waterfowl hunters, has also been a factor in their decline (Sykes 1976).

Basis for Priority Status: The Florida Everglade Kite is regarded as Endangered by the U. S. Department of Interior, Florida Game and Fresh Water Fish Commission, and the Florida Committee on Rare and Endangered Plants and Animals on the basis of the current critical level of its population and the continuing destruction of freshwater marsh habitats in the state.

Potential Impacts of Mining: Mining and reclamation activities in the seven-county area would probably have no impact on the status of the Florida Everglade Kite within the seven-county area or state as a whole. At most, reduction of extensive areas of freshwater marshes in the course of mining and failure to reestablish similar habitats as part of reclamation programs might reduce the future frequency of transient birds in the area. It is possible that good kite habitats could be created in extensive slime pond areas by introduction of Apple Snails and manipulation of water levels to provide proper depth and condition of emergent vegetation for kite feeding and nesting.

Selected References:

*Brown, L., and D. Amadon. 1968. Eagles, hawks and falcons of the world. McGraw-Hill Book Co., New York. 2 vols.

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*McMarrell, C. E., and P. F. Ebersbach. Avon Park bombing and gunnery range multiple use resources management plan. Unpubl. MS.

*Snyder, N. F. R., and H. A. Snyder. 1969. A comparative study of mollusc predation by Limpkins, Everglade Kites, and Boat-tailed Grackles. The Living Bird 8:177-224.

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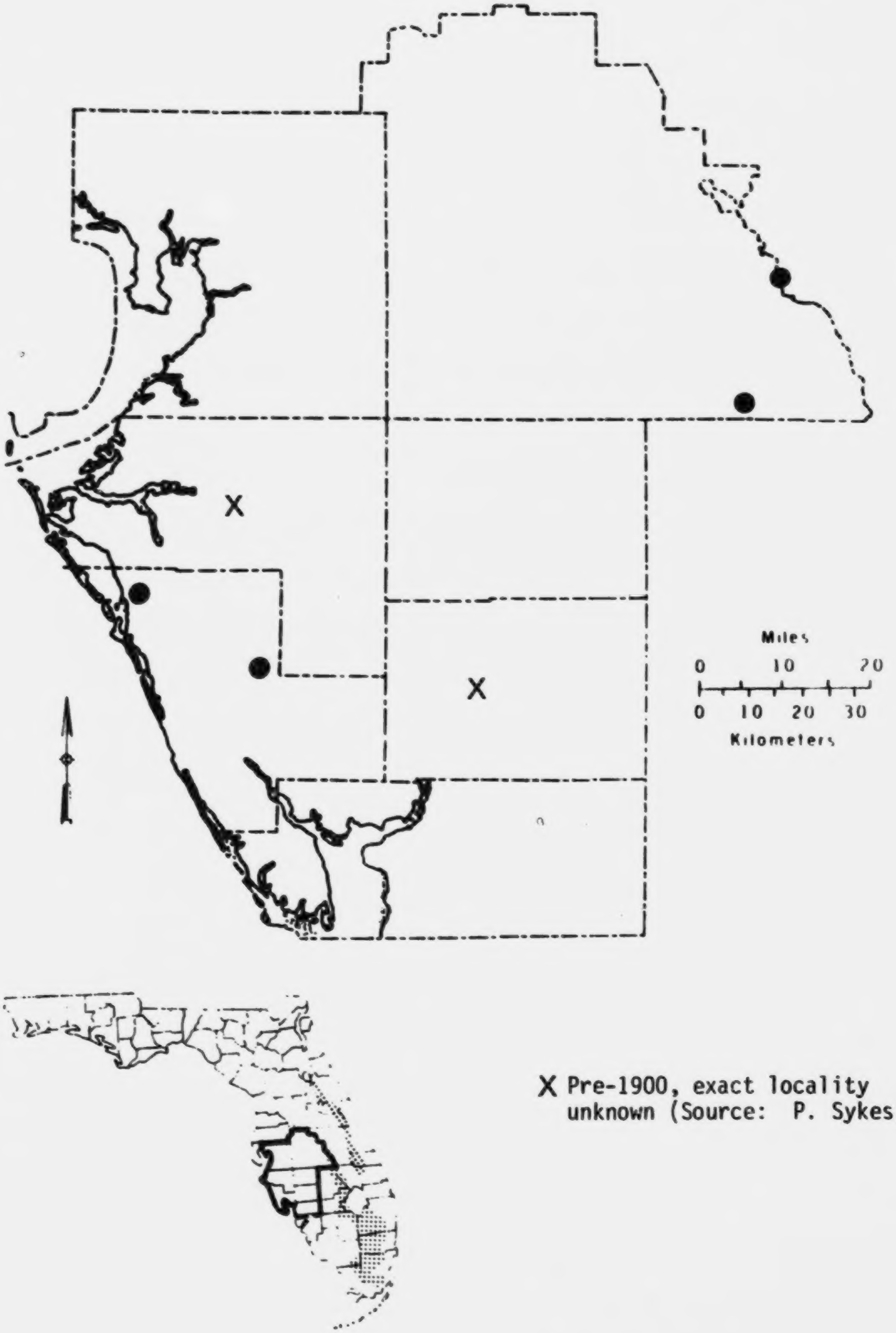
*Stieglitz, W. O., and R. L. Thompson. 1967. Status and life history of the Everglade Kite in the United States. U. S. Government Printing Office, Washington, D. C., U. S. Fish and Wildl. Serv. Spec. Sci. Rept., Wildl. No. 109. 21 pp.

*Sykes, P. W. 1976. Florida Everglade Kite, Pages 671-676 _in_ Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

*Wilson, J. L. 1971. Everglade Kite (_Rostrhamus sociabilis_) in Highlands County. Fla. Nat. 44(4):122.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X Pre-1900, exact locality unknown (Source: P. Sykes)

Fig. VIII.D.69. FLORIDA EVERGLADE KITE (Rostrhamus sociabilis plumbeus)

Biologically Significant

GOSHAWK *Accipiter gentilis* (Linnaeus)

Order Falconiformes Family Accipitridae

Distribution: An individual of this species was reported from Manatee County on the 1971-72 Bradenton Christmas Bird Count. If correctly identified, the bird may have been an escapee, as this far northern species is only a casual visitor (four records, Stevenson 1976) in Florida. The nearest previous record was from Maximo Point, Pinellas County, in 1927 (Howell 1932). In North America, the Goshawk breeds from northwestern Alaska and northern Canada southward to California, Nevada, Arizona, Colorado, northern Minnesota, Michigan, Pennsylvania, and western Maryland and possibly to North Carolina in the mountains (Stevenson 1976).

Habitat: Nothing is known of the habitats in which specimens have been observed or collected in Florida. Within its normal range, the Goshawk is primarily a bird of deciduous or coniferous forests. Howell (1932) stated that it is often found along water courses during migration.

Population Status: As evidenced by the few Florida records, the species is extremely rare in the state.

Basis for Priority Status: As a "top-carnivore," this species, like other raptors, is a useful indicator of the status of the natural ecosystems of which it is a member.

Potential Impacts of Mining: Because of the extremely rare occurrence of this species in the seven-county area, mining and reclamation activities would have no effect on its status.

Selected References:

Brown, L., and D. Amadon. 1968. Eagles, hawks and falcons of the world. McGraw-Hill Book Co., New York. 2 vols.

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

*Stevenson, H. M. 1976. Vertebrates of Florida, identification and distribution. Univ. Presses of Fla., Gainesville. 607 pp.

Listed - Blue List

SHARP-SHINNED HAWK *Accipiter striatus* Vieillot

Order Falconiformes Family Accipitridae

Other Names: Little Blue Darter

Distribution: The Sharp-shinned Hawk is a regular winter resident and migrant throughout the seven-county area. Actual records are available for each county, although the only one for Hardee County is based on a somewhat questionable sighting. Extreme dates of available records from the seven-county area are 5 October and June, the latter date being based on a questionable identification. There are more reliable sightings for May. The species is found in winter throughout Florida. Howell (1932) stated that it probably bred locally in the state in small numbers. He referred to nesting in Alachua and Hernando counties, but cited no specific records. Sprunt (1954) questioned Howell's statement regarding the breeding status of the Sharp-shin, in Florida, noting that there were no reliable nest records from the state. However, Baynard (1942) refers to an early (pre-1942) nesting record for Hillsborough River State Park. If the Sharp-shinned Hawk currently breeds in Florida, which is improbable, it would most likely do so in the northern part of the state. The North American breeding range of the species extends from northwestern Alaska and northern Canada south to California, New Mexico, Texas, Louisiana, Alabama, South Carolina, and the Greater Antilles. It winters as far south as Panama (Stevenson 1976).

Habitat: The Sharp-shinned Hawk has been observed in a variety of coastal and inland habitats within the seven-county area, including flatwoods, hammocks, mangrove swamps, beaches and interior sand flats, phosphate-mined areas, and citrus groves. Its general habitat preferences are areas of mixed forest or brush and open land. Observations by G. E. Woolfenden (pers. comm.) suggest that Sharp-shins may occasionally roost communally in Florida in winter. On two occasions, in January 1976 and 1977, he observed groups of six individuals departing at dawn from the same area of mangroves.

Population Status: Although it may be relatively common at certain localities in some years, the Sharp-shinned Hawk appears to be best regarded as uncommon in the seven-county area as a whole. However, because of its less conspicuous habits compared to many other hawks, it may actually be more abundant than observations suggest. Based on Christmas Bird Count data for 1974-1976 (Table VIII.D.5), there are no obvious differences in abundance in different parts of the seven-county area; counts in all census areas were less than one bird per 10 party hours. The generally low numbers of individuals sighted in the combined Christmas Bird Counts from 1966 through 1976 (Table VIII.D.6) do not show any long-term population trends. J. B. Edscorn (pers. comm.) believes the species has increased in the Lakeland area of Polk County in recent years. Howell's (1932) statement that the Sharp-shin was "formerly more numerous" and the possibility that it once nested locally in peninsular Florida suggest that the species underwent an early decline in Florida. As the possible reduction took place long before occurrence of major habitat destruction, use of pesticides, and other "modern" deleterious impacts on birds of prey, the decline may reflect some adjustment in geographic range in relation to natural climatic or other environmental changes.

Basis for Priority Status: The Sharp-shinned Hawk is listed on the 1977

Blue List of the National Audubon Society. Although encouragingly large numbers of migrants were recorded at northern localities in the fall of 1976, most observers favored continuing the species on the list. In some areas the species is not breeding well (Arbib 1977). The seven-county area provides extensive areas of suitable winter habitat for the species.

Potential Impacts of Mining: Elimination of potential natural habitat of this species would be a primary impact of actual mining. A large proportion of the area of phosphate reserves within the seven-county area consists of habitat types used by this species. Areas reclaimed to extensive grasslands, citrus groves, pine plantations, or used for development would not be extensively utilized by the Sharp-shinned Hawk. However, reclaimed lands with interspersed woody and open vegetation attractive to small birds would favor the species.

Selected References:

*Arbib, R. 1977. The Blue List for 1977. Am. Birds 30(6):1031-1039.

*Baynard, O. E. 1942. A check-list of birds Myakka River State Park. Fla. Forest and Park Serv., Sarasota, Florida. 15 pp.

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

*Sprunt, A., Jr. 1954. Florida bird life. Coward-McCann, Inc., New York. 527 pp.

*Stevenson, H. M. 1976. Vertebrates of Florida, identification and distribution. Univ. Presses of Fla., Gainesville. 607 pp.

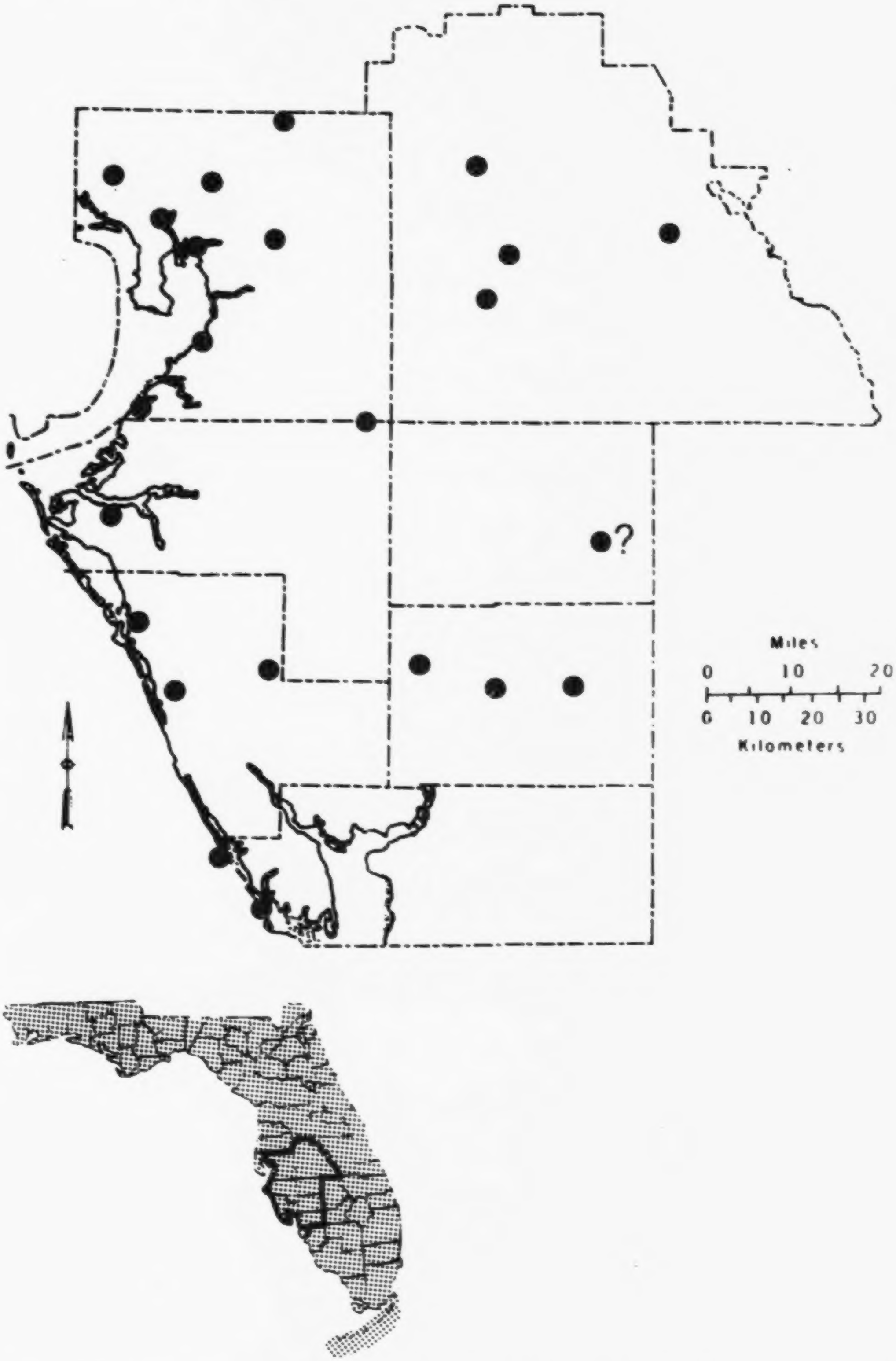
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Fig. VIII.D.70. SHARP-SHINNED HAWK (Accipiter striatus)

Listed - Species of Special Concern, Blue List

COOPER'S HAWK — *Accipiter cooperii* (Bonaparte)

Order Falconiformes — Family Accipitridae

Other Names: Big Blue Darter

Distribution: The Cooper's Hawk is a permanent resident throughout most of the seven-county area. Actual records are available from all but one (Charlotte) of the counties. However, the species has been observed in nearby Glades County (J. N. Layne unpubl. data). There appears to be no significant seasonal difference in the geographic location of records. The breeding range of the Cooper's Hawk in Florida extends south to about the level of Lake Okeechobee, and it occurs throughout the state in winter (Snyder 1976). The over-all breeding range extends from southern Canada southward to Baja California, northern Mexico, south-central Texas, Louisiana, Mississippi, and Florida. It winters southward to Costa Rica (Stevenson 1976).

Habitat: Within the seven-county area, the Cooper's Hawk has been reported from flatwoods, hammocks, swamps, and sand flats. In general it is a bird of woodlands interspersed with open areas.

Population Status: The Cooper's Hawk is rare but fairly regular in the seven-county area in winter. Its status in summer is uncertain. Although regarded by some authors as a permanent resident in this part of Florida, there appear to be no recent midsummer records of Cooper's Hawks in the seven-county area, the dates of records falling between October and June. It is stated to be an occasional resident in Myakka River State Park (Fla. Dept. Nat. Res. 1976), a permanent resident in the lower Hillsborough River area (Woolfenden 1974), a winter resident in Hillsborough River State Park (Stevenson 1967), and a rare and local winter resident in the Lakeland area (Edscorn unpubl. MS). On this basis, it seems the species should be presently regarded as extremely scarce and local in the seven-county area in summer. Further indication of the difference in its relative abundance in winter and summer (June) is given by the data of the Christmas and Summer Bird Counts for the Tampa region from 1972 through 1977 (Table VIII.D.11). A total of five individuals was observed in four of the six winter censuses, as compared with one individual recorded in the six summer censuses. Other quantitative data on abundance in the seven-county area in late spring-early summer are given by Dames and Moore (1975) and Stevenson (1975). The former reported two individuals in 10.46 hours of observation in mixed hardwood habitat in the Alafia and Little Manatee river basins, Hillsborough County, in April and May. In June, Stevenson observed .00+/hour on Pinellas, Hillsborough, and Manatee County census routes combined and .02-/hour in DeSoto and Hardee counties combined.

Based on Christmas Bird Count data from seven localities in the seven-county area from 1974 to 1976 (Table VIII.D.5), the average frequency of the Cooper's Hawk was less than one individual per 10 party hours in all areas, with no indication of geographic trends in abundance.

There is no indication from the compilation of Christmas Bird Count data from 1962-1976 (Table VIII.D.6) of any trend in frequency of sightings over the 11-year period, numbers being consistently below one bird per 10 party hours in all years. These regional data, therefore, do not reflect the sharp decline in the Cooper's Hawk population in the northeastern part of its range and perhaps elsewhere that has occurred over the past 20 years (Henny and Wight 1972). However, it appears that the species now breeds even less frequently in the seven-county area than earlier, the only (2) nesting records (Howell 1932, Baynard 1942) for the region being pre-1932 and pre-1942, respectively. The evidence suggests that the breeding range may have retreated northward as the result of a climatic shift or other natural environmental change prior to the population decline caused by direct human impacts.

In comparison with its congener, the Sharp-shinned Hawk, the Cooper's Hawk is considerably rarer in the seven-county area.

Basis of Priority Status: The Cooper's Hawk is listed as a Species of Special Concern by the Florida Committee on Rare and Endangered Plants and Animals and included on the 1977 Blue List of the National Audubon Society on the basis of the strong downward trend in its population and its importance as an indicator organism for monitoring environmental change.

Potential Impacts of Mining: Mining and reclamation activities would probably have an insignificant impact on the status of this species in the seven-county area. However, in general, elimination of extensive areas of natural wooded and open areas by mining would reduce potential winter and breeding habitat. Present types of reclamation would not result in long-term restoration of good habitat.

Selected References:

*Baynard, O. E. 1942. The birds of Hillsborough River State Park. Fla. Park Serv. 18 pp.

Brown, L., and D. Amadon. 1968. Eagles, hawks and falcons of the world. McGraw-Hill Book Co., New York. 2 vols.

Cowell, B. C., D. G. Burch, L. N. Brown, R. W. McDiarmid, and G. E. Woolfenden. 1974. Biological assessment of the Lower Hillsborough Flood Detention Area. Southwest Florida Water Management Dist., Brooksville, Florida. 111 pp.

*Dames and Moore. 1975. Hydrobiologic assessment of the Alafia and Little Manatee rivers. Report prep. for the Southwest Fla. Water Management Dist. by Dames and Moore, Consulting Engineers, Atlanta, Georgia.

*Edscorn, J. B. Birds of the Lake Region. Unpubl. MS.

*Florida Department of Natural Resources. 1976. Vertebrates of Myakka River State Park. 26 pp.

*Henny, C. J., and H. M. Wight. 1972. Population ecology and environmental pollution: Red-tailed and Cooper's Hawks, Pages 229-250 _in_ Population ecology of migratory birds. Bur. of Sport Fisheries and Wildl., Wildl. Res. Rept. 2. Washington. 278 pp.

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

*Snyder, P. W. 1976. Cooper's Hawk, Pages 869-873 _in_ Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

*Stevenson, H. M. 1975. Report to the Game and Fresh Water Fish Commission on avian forms of special concern in Florida. Progress Rept., Job XIV-A-4. 63 pp.

*Stevenson, H. M. 1976. Vertebrates of Florida, identification and distribution. Univ. Presses of Fla., Gainesville. 607 pp.

*Stevenson, J. A. 1967. A list of the vertebrates identified in Hillsborough River State Park. Fla. Brd. of Parks. 16 pp.

*Woolfenden, G. E. 1974. Bird habitat distribution and population estimates, Pages 54-66 _in_ Cowell, B. C., _et al_., Biological assessment of the Lower Hillsborough Flood Detention Area for recommendation of ecologically based land management. Univ. of So. Fla., Tampa. 111 pp.

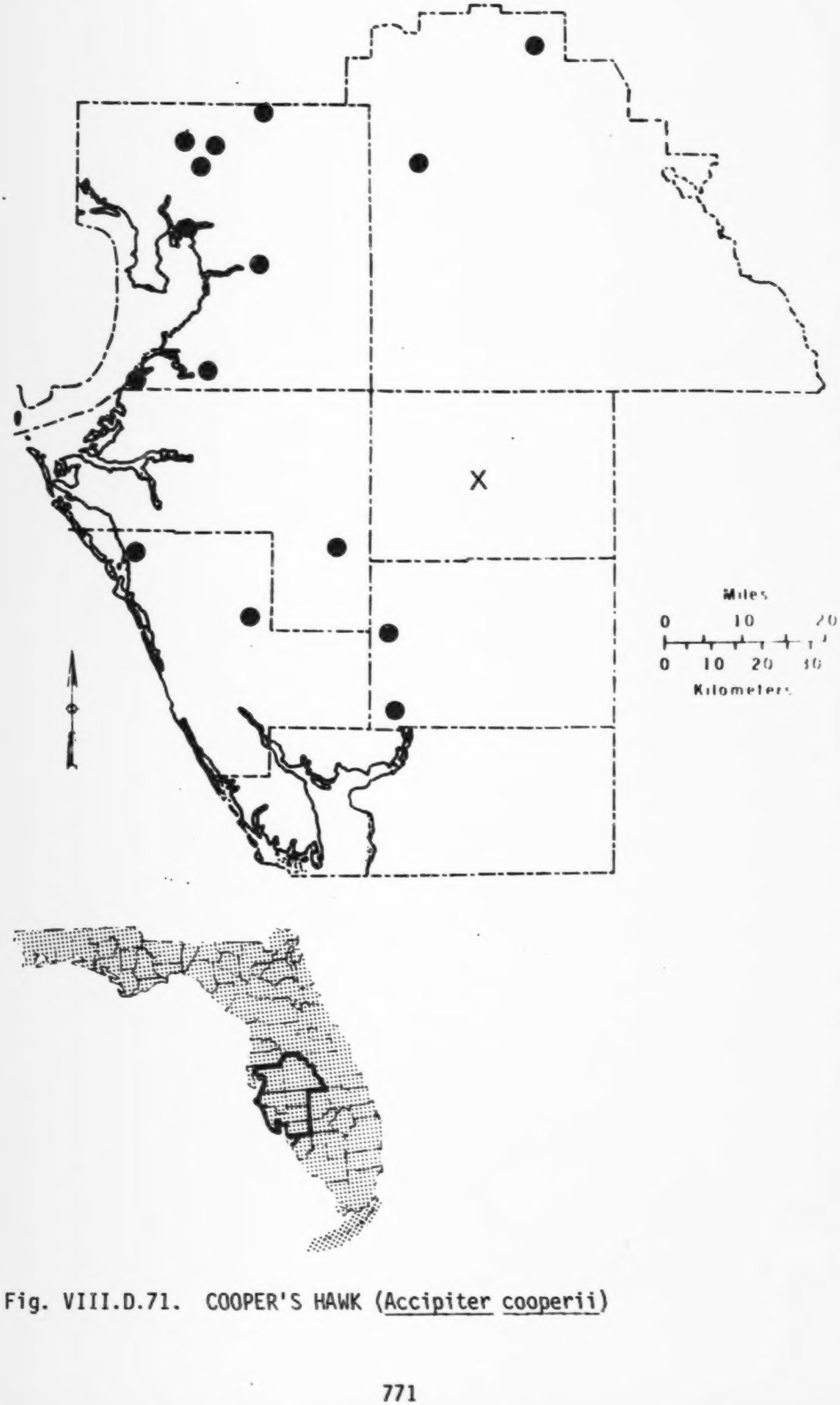
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Fig. VIII.D.71. COOPER'S HAWK (*Accipiter cooperii*)

Biologically Significant

RED-TAILED HAWK — *Buteo jamaicensis* (Gmelin)

Order Falconiformes — Family Accipitridae

Distribution: The Red-tailed Hawk is generally distributed as a permanent resident in the seven-county area and there are several to many records from each county. Nesting or courtship activity has been recorded in Hillsborough (Baynard 1942a, G. E. Woolfenden pers. comm.), Polk (J. B. Funderburg pers. comm.), and Sarasota and/or Manatee (Fla. Dept. Nat. Res. 1976) counties. Three recognized subspecies may occur in the seven-county area. *B. j. umbrinus*, first described from Myakka, Manatee County, ranges through peninsular Florida north to Tampa Bay, and is probably the usual form found in the region. *B. j. borealis*, a northern race breeding south to northern Florida, may enter the area in winter. Baynard (1942a) regarded it as an occasional winter visitor at Hillsborough River State Park. The well-marked western subspecies, *B. j. kriderii*, is an irregular visitor in the seven-county area. It has been recorded in the vicinity of Lakeland, Polk County, during the winter of 1967-68 (Stevenson 1969) and in December 1976 (G. E. Woolfenden pers. comm.). The Red-tailed Hawk is present year-round throughout the state, with the exception of the Keys (Robertson and Kushlan 1974). It has a wide range in North America, breeding from central Alaska and Canada southward to Panama, the northern Gulf coast, and the Antilles, and wintering from western Canada and northern United States to the southern limits of the breeding range (Stevenson 1976).

Habitat: This hawk occurs in a fairly wide range of natural and man-modified habitats within the seven-county area, including phosphate mined areas. It is generally associated with relatively open and comparatively dry country. Within the seven-county area it is found in open pine flatwoods and native prairie or improved pasture areas with scattered trees or patches of woodland. It frequently nests in tall isolated pines.

Population Status: The Red-tailed Hawk is uncommon in the seven-county area as a whole, although it may be common at certain seasons in some localities. The available quantitative population data do not, however, show any clear-cut regional differences. The population is apparently higher in winter than summer, presumably augmented by more northern birds. Comparison of Christmas and Summer Bird Count data from the Tampa area for the period 1972-1977 (Table VIII.D.11) shows Red-tails to be about twice as frequent (1.2 individuals per 10 party hours) in winter as in summer (0.6 individuals per 10 party hours). Archbold Biological Station Roadside Census data from parts of Hardee, DeSoto, and Charlotte counties indicate a similar winter increase in that part of the seven-county area (Table VIII.D.9). Of a total of 24 individuals tallied on summer and winter counts from 1974 through 1977, 19 (79 percent) were observed in winter (Table VIII.D.10).

Howell (1932) stated that the species was rare to fairly common but was rapidly becoming scarce. Sprunt (1954) concluded that it had somewhat decreased in numbers in the years since Howell's assessment. Baynard (1942b) listed the species as an uncommon permanent resident in Myakka River State Park, whereas a more recent check-list for that park (Fla. Dept. Nat. Res. 1976) gives its status as a common resident. These limited observations suggest that the status of the Red-tailed Hawk in the region has not experienced any marked long-term trend and that it is probably as abundant now, or perhaps slightly more so, as it was 40-50 years ago. The combined data of the Bradenton, Lakeland, Myakka River State Park, and Sarasota Christmas Bird Counts for the 1966-1976 period and Breeding Bird Surveys conducted in the region from 1966-1976 show no trend in this interval (Table VIII.D.6). The picture of a relatively stable Red-tail population in the seven-county area agrees with the conclusion of Henny and Wight (1972) for the species as a whole.

Basis for Priority Status: This species is listed as biologically significant on the basis of the general sensitivity, because of their position high on the food chain, of raptors to environmental changes. Furthermore, the population in the area of the type-locality in Manatee County is scientifically important.

Potential Impacts of Mining: Much of the seven-county area presently provides suitable habitat for this species and mining would probably result in some net loss of habitat. However, the overall impact of mining on the status of the species in the general region would probably not be significant. Mined areas left in a natural state or restored to predominantly grassland habitats with scattered trees presumably would be reoccupied by Red-tails.

Selected References:

*Baynard, O. E. 1942a. The birds of Hillsborough River State Park. Fla. Park Serv., Sarasota, Florida. 18 pp.

*Baynard, O. E. 1942b. A check-list of birds Myakka River State Park. Fla. Forest and Park Serv., Sarasota, Florida. 15 pp.

*Florida Department of Natural Resources. 1976. Vertebrates of Myakka River State Park. 16 pp.

*Henny, C. J., and H. M. Wight. 1972. Population ecology and environmental pollution: Red-tailed and Cooper's hawks, Pages 229-250 in Population ecology of migratory birds. Bur. of Sport Fisheries and Wildl., Wildl. Res. Rept. 2, Washington. 278 pp.

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

*Robertson, W. B., Jr., and J. A. Kushlan. 1974. The southern Florida avifauna, Pages 414-452 in Gleason, P. J., ed., Environments of south Florida: present and past. Miami Geol. Soc. Memoir 2. 452 pp.

*Sprunt, A., Jr. 1954. Florida bird life. Coward-McCann, Inc., New York. 527 pp.

*Stevenson, H. M. 1969. Florida region. Aud. Field Notes 23(3): 468-473.

*Stevenson, H. M. 1976. Vertebrates of Florida, identification and distribution. Univ. Presses of Fla., Gainesville. 607 pp.

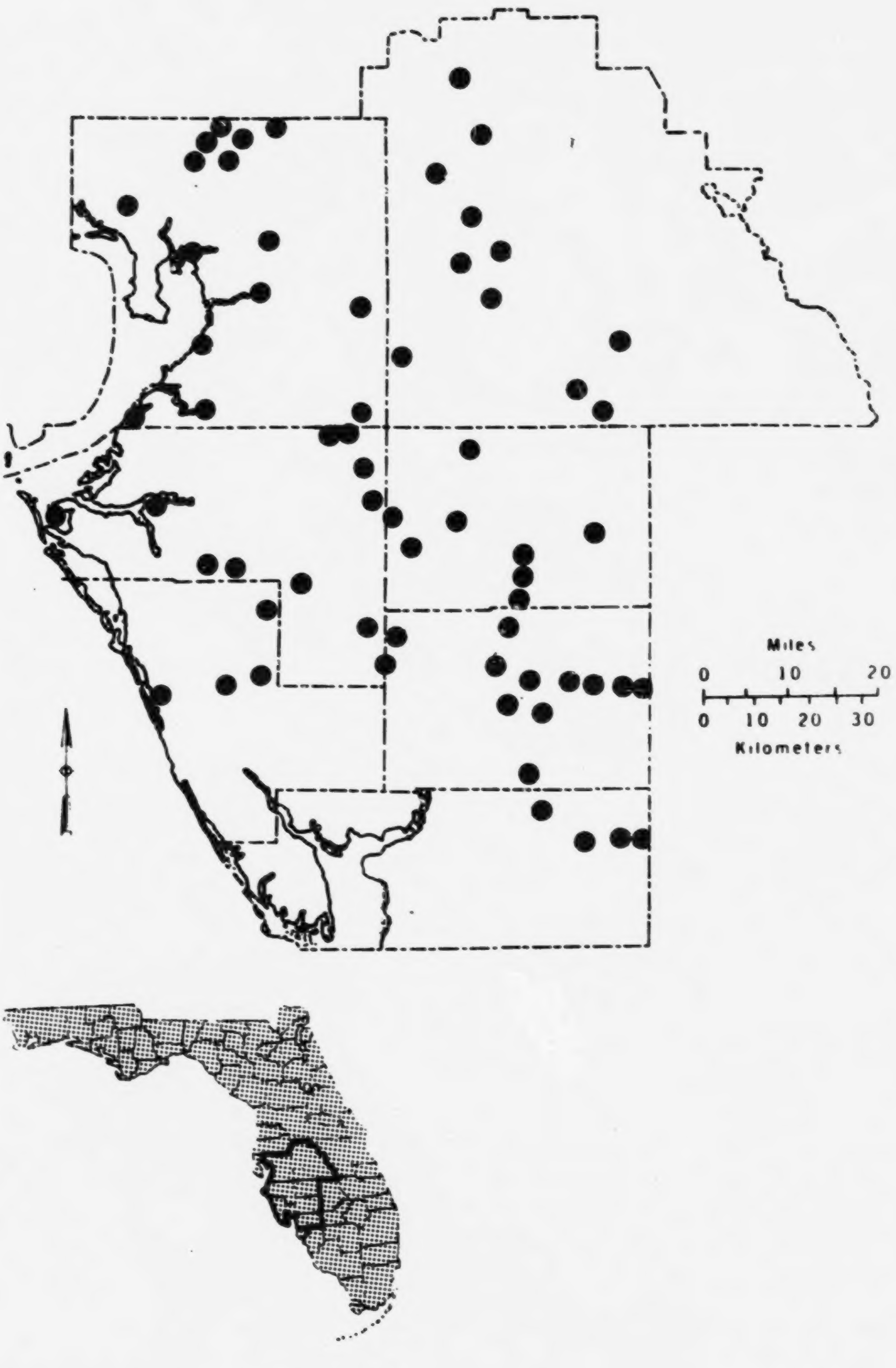
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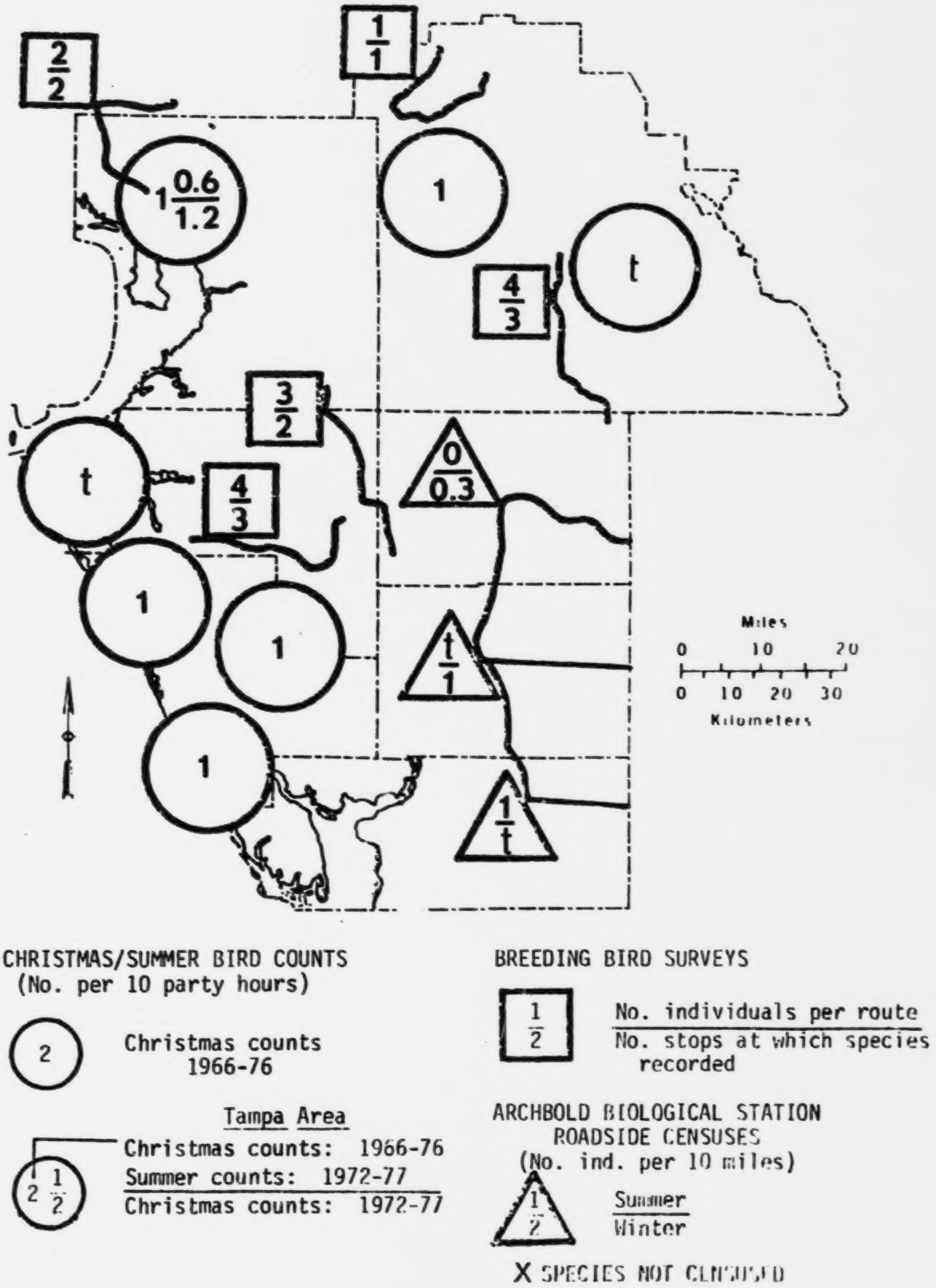
Fig. VIII.D.72. RED-TAILED HAWK (Buteo jamaicensis)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Miles
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Kilometers
CHRISTMAS/SUMMER BIRD COUNTS
(No. per 10 party hours)
2
Christmas counts 1966-76
Tampa Area
2 1/2
Christmas counts: 1966-76
Summer counts: 1972-77
Christmas counts: 1972-77
BREEDING BIRD SURVEYS
1/2
No. individuals per route
No. stops at which species recorded
ARCHBOLD BIOLOGICAL STATION ROADSIDE CENSUSES
(No. ind. per 10 miles)
1/2
Summer
Winter
X SPECIES NOT CENSUSED

Fig. VIII.D.73. RED-TAILED HAWK (Buteo jamaicensis). Population data.

Listed - Blue List

RED-SHOULDERED HAWK — *Buteo lineatus* (Gmelin)

Order Falconiformes — Family Accipitridae

Distribution: The Red-shouldered Hawk is a permanent resident throughout the seven-county area and has been recorded in every county. Within the study area, it has been recorded nesting in DeSoto (Evans 1923) and Hillsborough (Bent and Copeland 1927, Stevenson 1967, G. E. Woolfenden pers. comm.) counties and Myakka River State Park (Fla. Dept. Nat. Res. 1976). It is found as a permanent resident throughout the state, including the Florida Keys and Dry Tortugas (Howell 1932). The resident subspecies in the seven-county area is presumably *B. l. alleni*, which ranges over the entire state except the extreme tip (AOU 1957). *B. l. extimus* of southern Florida and the Keys has been reported north to Lake Okeechobee (Sprunt 1954) and thus may occasionally occur in the southern part of the seven-county area. The northern subspecies, *B. l. lineatus*, winters southward to Florida, and members of this population may sometimes reach the study area. The total range of the species includes eastern North America from southern Canada southward to central Mexico and the Florida Keys and an isolated area in California.

Habitat: The species occurs in a wide variety of coastal and inland habitats in the seven-county area. It prefers swamps but will inhabit marshes or wet prairies if some trees are near. It also occurs in drier situations such as pine flatwoods and mesic hammocks. Suitable nest trees typically are within or at the edge of hardwood forest stands.

Population Status: The Red-shouldered Hawk is abundant in the seven-county area. It is the most common of the buteo hawks in Florida. Data from Christmas Bird Counts, Breeding Bird Surveys, and Archbold Biological Station Roadside Censuses (Tables VIII.D.5, 7, 10) suggest that the highest population of the species in the seven-county area may be in the eastern parts of Manatee and Sarasota counties.

There is some evidence of a winter population increase. Between 1972 and 1977 an average of 1.3 individuals per 10 party hours was recorded in summer compared with 2.4 per 10 party hours in winter in the Tampa Summer and Christmas Bird Counts (Table VIII.D.11). However, almost equal numbers were counted in summer and winter on the Archbold Biological Station Roadside Censuses in parts of Charlotte, DeSoto, and Hardee counties from 1974 to 1977 (Table VIII.D.10).

The 1966-1976 combined Christmas Bird Count data from the Bradenton, Lakeland, Myakka River State Park and Sarasota regions suggest a slight decrease in this species in recent years. From 1966 to 1970 counts ranged from 3 to 5 (mean = 4.2) birds per 10 party hours, whereas from 1971 to 1976 counts were 2 or 3 (mean = 2.7) birds per 10 party hours. The Archbold Biological Station Summer and Winter Roadside Censuses from 1974 to 1977 showed no consistent trend (Table VIII.D.10).

The numbers of Red-shoulders recorded on the Hillsborough and Manatee Breeding Bird Survey routes from 1966 through 1976 are erratic and reveal no obvious trends over the 11-year period (Table VIII.D.8). However, in both areas the highest counts recorded during the interval were in 1966. Christmas Bird Counts over a 30-year period (1947-1976) in the Myakka River State Park area suggest that population levels were highest in this region in the 1960's and early 1970's and somewhat lower prior to and after this period. The mean number of birds per 10 party hours was 0.66 (range = 0.12 - 1.54) over the 1947-1961 interval, 1.71 (range = 0.78 - 1.45) from 1962 to 1972, and 0.77 (range = 0.63 - 0.90) from 1973 to 1976. In sum, the over-all impression gained from available data is that, although still an abundant hawk, the Red-shoulder may have declined slightly in the seven-county area over the past four to six years.

Basis for Priority Status: This species is included on the 1977 Blue List of the National Audubon Society on the basis of a marked decline of populations in some parts of its range in recent years (Henny 1972). The predilection of this species for swamps and marshes makes it a useful indicator of the status of wetland ecosystems.

Potential Impacts of Mining: If mining is conducted within the flood plains of the rivers and streams in the seven-county area, the consequent elimination of swamp and hydric hammock forests, which serve as important nesting areas, will have a significant negative impact on the status of this species. Destruction of open wetland areas, including seasonal or permanent marshes and wet prairies, and upland forest areas bordering such habitats would probably also be accompanied by reduction of the population. Present types of reclamation leading to grassland areas and relatively steep-sided artificial ponds and lakes with little emergent vegetation will not adequately substitute for the original natural habitats of the species.

Selected References:

*American Ornithologists' Union. 1957. Check-list of North American birds. The Lord Baltimore Press, Baltimore, Maryland. 691 pp.

*Bent, A. C., and M. Copeland. 1927. Notes on Florida birds. Auk 44(3):371-386.

Brown, L., and D. Amadon. 1968. Eagles, hawks and falcons of the world. McGraw-Hill Book Co. New York. 2 vols.

*Evans, L. I. 1923. An annotated list of birds observed in south Florida. Oologist 40:2-8.

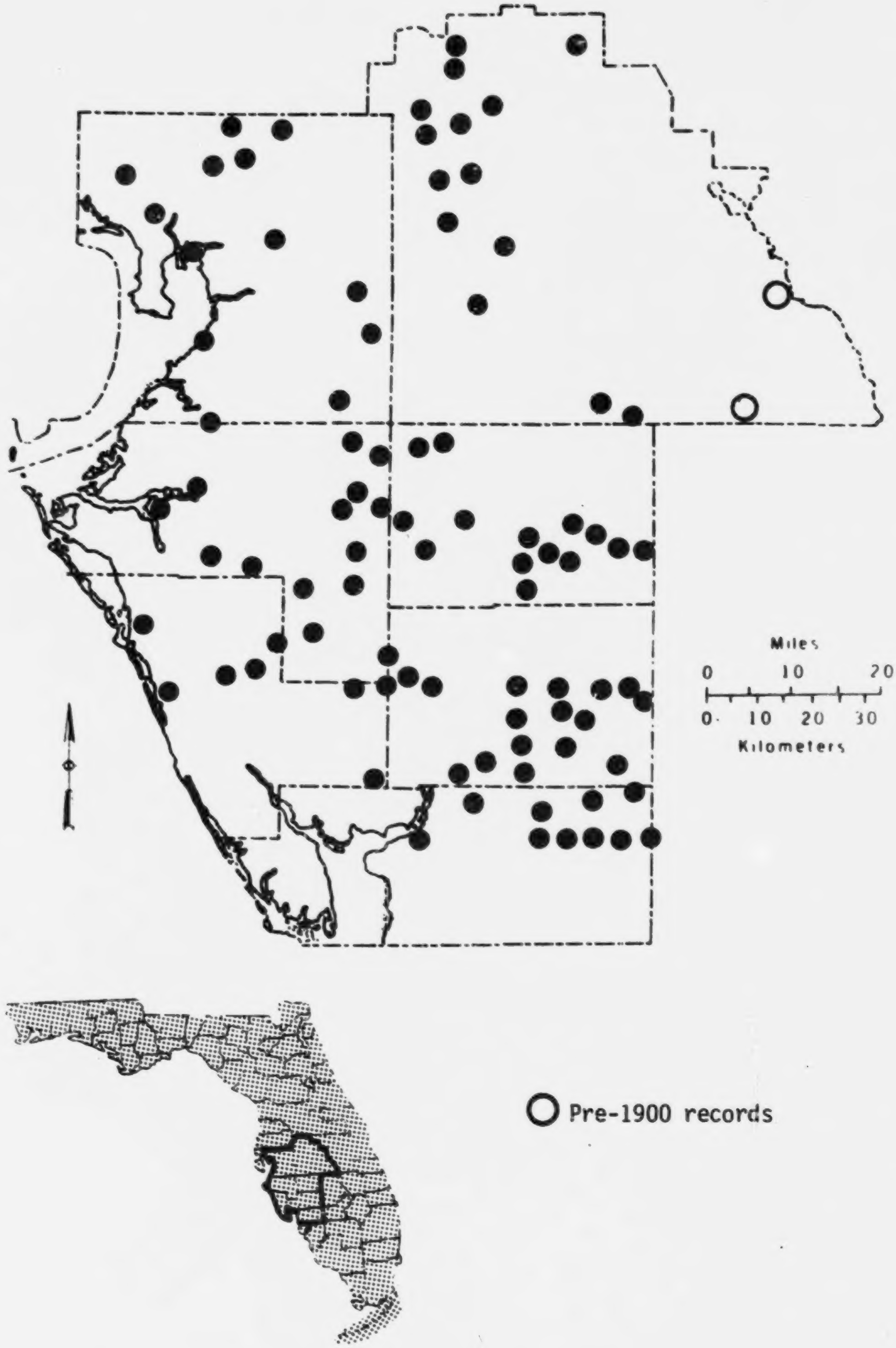
*Florida Department of Natural Resources. 1976. Vertebrates of Myakka River State Park. 26 pp.

*Henny, C. J. 1972. An analysis of the population dynamics of selected avian species with special reference to changes during the modern pesticide era. Bur. of Sport Fisheries and Wildl., Wildl. Res. Rept. 1. 99 pp.

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

*Sprunt, A., Jr. 1954. Florida bird life. Coward-McCann, Inc., New York. 527 pp.

*Stevenson, J. A. 1967. A list of the vertebrates identified in Hillsborough River State Park. Fla. Brd. of Parks. 16 pp.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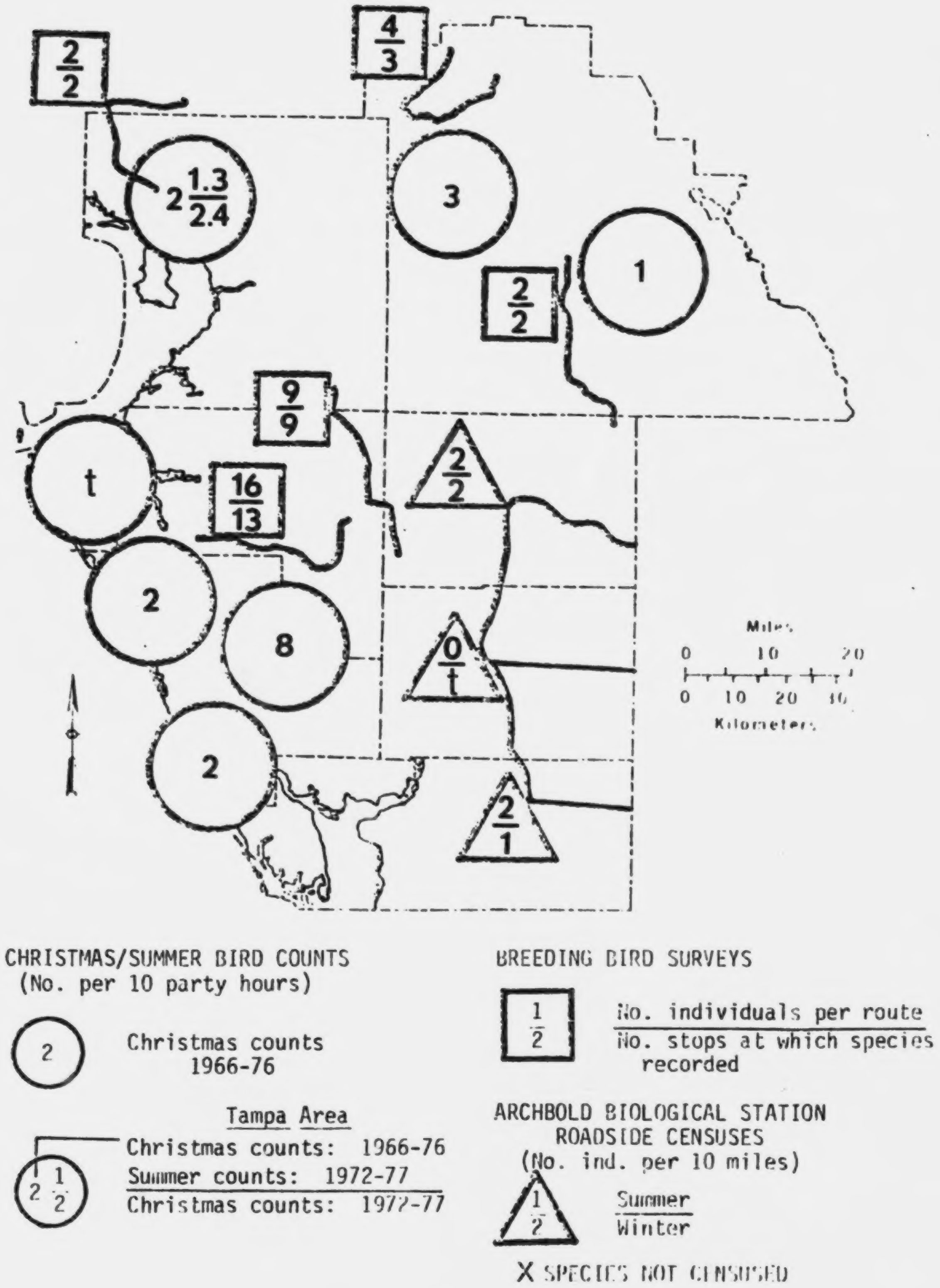
○ Pre-1900 records

Fig. VIII.D.74. RED-SHOULDERED HAWK (*Buteo lineatus*)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Kilometers
CHRISTMAS/SUMMER BIRD COUNTS
(No. per 10 party hours)
2 Christmas counts 1966-76
Tampa Area
Christmas counts: 1966-76
Summer counts: 1972-77
Christmas counts: 1972-77
BREEDING BIRD SURVEYS
1/2 No. individuals per route / No. stops at which species recorded
ARCHBOLD BIOLOGICAL STATION ROADSIDE CENSUSES
(No. ind. per 10 miles)
1/2 Summer / Winter
X SPECIES NOT CENSUSED

Fig. VIII.D.75. RED-SHOULDERED HAWK (Buteo lineatus). Population data.

Biologically Significant

BROAD-WINGED HAWK Buteo platypterus (Vieillot)

Order Falconiformes Family Accipitridae

Distribution: The Broad-winged Hawk has been reported from all of the counties in the seven-county area except Hardee and Charlotte. Its present status in the region is uncertain, but the evidence suggests that it is best classified as a migrant and possibly an occasional winter resident. With one exception, recent (1966-1976) records are in spring, fall, and winter. One was seen in DeSoto County along the Peace River in April 1976 (Kale 1976). Three sightings, involving some question as to identification, in the Lakeland area (Polk County) were made from late September through October (J. B. Edscorn pers. comm.). Black (1967) recorded the species at Myakka River State Park in December 1966, and Stevenson (1967) listed it as an occasional winter visitor in Hillsborough River State Park. In contrast to these records indicating migratory or winter resident status, the species has recently been considered a permanent resident in the Big Four Mine area along the south prong of the Alafia River in Polk County, with occasional sightings reported in July 1974 (Borden Phosphate 1975). In view of the apparent rarity of the species anywhere in Florida in summer, this record must be considered as suspect. However, the Broad-wing evidently did formerly nest in the seven-county area, as Howell (1932) mentions breeding, with no details, at Manatee (Manatee County). Burns (1911) cites a report by Bendire of breeding in Hillsborough County prior to 1892.

This species has been reported from throughout Florida. Howell (1932) considered that it was generally distributed in the state and bred locally in small numbers south to at least Lake Harney. Sprunt (1954) regarded its status as uncertain and stated that it was definitely not common at that time, being more apt to occur in the northern and western parts of the state. J. B. Edscorn (pers. comm.) believes the species migrates mainly along the coasts and classified it as a very rare visitor in the Lakeland region (Edscorn unpubl. MS). It winters in substantial numbers in south Florida and the Keys (Dade and Monroe counties) (Tabb 1973). Ogden (1971, 1973) reported recent nesting at Gainesville (Alachua County), and Robertson and Kushlan (1974) indicate that the species was perhaps never widespread in peninsular Florida and that the absence of recent breeding records south of Alachua County is indicative of a reduction of its range in the state. The Broad-winged Hawk population found in Florida (_B_. _p_. _platypterus_) breeds from southern Canada southward to Texas, the Gulf coast, and Florida and winters from southern Florida and Central America southward to Peru and Brazil (Stevenson 1976).

Habitat: This species inhabits wooded regions. Burns (1911) gives upland hillsides and swamps with occasional openings as the ideal habitats. In south Florida, preferred habitats are relatively undisturbed hardwood hammocks, but densely overgrown old fields with openings nearby are also frequently inhabited (Tabb 1973). Specific habitat data for this species from the seven-county area are meager. It has been reported from hammocks and pine flatwoods in Myakka River State Park (Fla. Dept. Nat. Res. 1976). The individual reported along the Peace River in 1966 was probably in swamp forest habitat. The alleged summer sightings in the Big Four Mine area were in pine plantations.

Population Status: The species is rare and irregular in the seven-county area. Based on Howell's (1932) and Burns' (1911) observations, it is apparently less regular in the area presently than 50 or so years ago, particularly as a breeder. According to Robertson and Kushlan (1974) the loss of breeding range in Florida is not directly attributable to human agency.

Basis for Priority Status: Because of its role as a predator relatively high on food chains, this species, as in the case of other birds of prey, is a useful indicator of the condition of the ecosystems of which it is a part.

Potential Impacts of Mining: In view of the already existing rarity of the Broad-wing in the seven-county area, mining activities should have no discernible effect on its status in the area or state as a whole.

Selected References:

*Black, B. H. 1967. Myakka River State Park -- largest of them all!

*Borden Phosphate. 1975. Big Four Mine. DRI application.

Brown, L., and D. Amadon. 1968. Eagles, hawks and falcons of the world. McGraw-Hill Book Co., New York. 2 vols.

*Burns, F. L. 1911. A monograph of the Broad-winged Hawk (Buteo platypterus). Wilson Bull. 23:140-320.

*Edscorn, J. B. Birds of the Lake Region. Unpubl. MS.

*Florida Department of Natural Resources. 1976. Vertebrates of Myakka River State Park. 26 pp.

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

*Kale, H. W., II. 1976. Florida region. Am. Birds 30(4):828-832.

*Ogden, J. C. 1971. Florida region. Am. Birds 25(5):846-851.

*Ogden, J. C. 1973. Florida region. Am. Birds 27(5):859-863.

*Robertson, W. B., Jr., and J. A. Kushlan. 1974. The southern Florida avifauna, Pages 414-452 _in_ Gleason, P. J., ed., Environments of south Florida: present and past. Miami Geol. Soc. Memoir 2. 452 pp.

*Sprunt, A., Jr. 1954. Florida bird life. Coward-McCann, Inc., New York. 527 pp.

*Stevenson, H. M. 1976. Vertebrates of Florida, identification and distribution. Univ. Presses of Fla., Gainesville. 607 pp.

*Stevenson, J. A. 1967. A list of the vertebrates identified in Hillsborough River State Park. Fla. Brd. of Parks. 16 pp.

*Tabb, E. C. 1973. A study of wintering Broad-winged Hawks in southeastern Florida 1968-1973. EBBA News 36(Supp.):11-29.

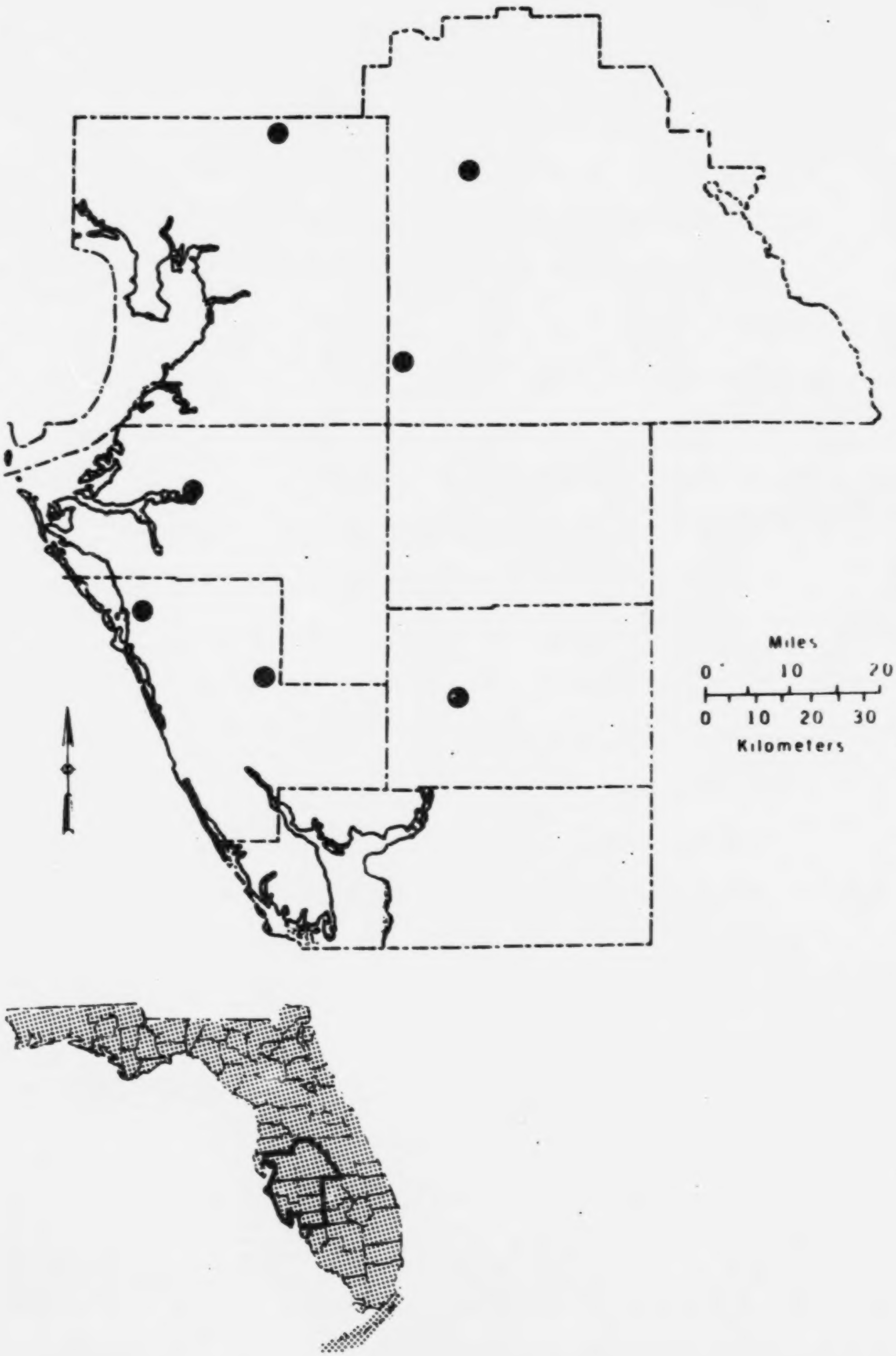

Miles
0
10
20
0
10
20
30
Kilometers

Fig. VIII.D.76. BROAD-WINGED HAWK (Buteo platypterus)

Listed - Blue List

SWAINSON'S HAWK

Buteo swainsoni Bonaparte

Order Falconiformes

Family Accipitridae

Distribution: This western hawk is an irregular migrant or winter visitor in the seven-county area and has been actually recorded from Charlotte, DeSoto, and Sarasota counties. Edscorn (unpubl. MS) lists its occurrence in the Lakeland area (Polk County) as hypothetical. Reports from the seven-county area have been in spring (Evans 1923), December (Stevenson 1964), and January (Stevenson 1976). A sighting on 2 September in Highlands County just east of the seven-county area was unusually early and suggests the possibility of summering (Robertson 1970). Stevenson (1976) stated that the Swainson's Hawk winters in extreme southern Florida from October to April and occurs rarely in migration in central and northern Florida. The species breeds from Alaska and northwestern Canada to western Minnesota and Illinois southward to Baja California and northern Mexico to southwestern Missouri and winters south to Argentina and Florida (Stevenson 1976). This species has the longest migrations of any North American hawk, and huge flocks of migrating individuals are often observed (Brown and Amadon 1968). The birds appearing in Florida probably represent only a small segment of the total species' population. Brown and Amadon (1968) noted that since 1950 up to 300 individuals, mostly immatures, have wintered in southern Florida.

Habitat: This is a bird of vast expanses of open country. In Florida, wintering immatures are found primarily foraging over freshly ploughed fields (Brown and Amadon 1968).

Population Status: The species is irregular and rare in the seven-county area. The total population in Florida in winter probably does not exceed 300 individuals (Brown and Amadon 1968).

Basis for Priority Status: The Swainson's Hawk is included on the 1977 Blue List of the National Audubon Society cn the basis of evidence of a long-term decline in its population.

Potential Impacts of Mining: In view of the rarity of the species in the seven-county area, it can be assumed that its status will not be significantly affected by mining. Mined areas and open pasturelands created by reclamation would probably be as suitable for the species as existing natural or semi-natural habitats.

Selected References:

*Brown, L., and D. Amadon. 1968. Eagles, hawks and falcons of the world. McGraw-Hill Book Co., New York. 2 vols.

*Edscorn, J. B. Birds of the Lake Region. Unpubl. MS.

*Evans, L. I. 1923. An annotated list of birds observed in south Florida. Oologist 40:2-8.

*Robertson, W. B., Jr. 1970. Florida region. Aud. Field Notes 24(1): 33-38.

*Stevenson, H. M. 1964. Florida region. Aud. Field Notes 18(3):346-351.

*Stevenson, H. M. 1976. Florida region. Am.Birds 30(3):708-711.

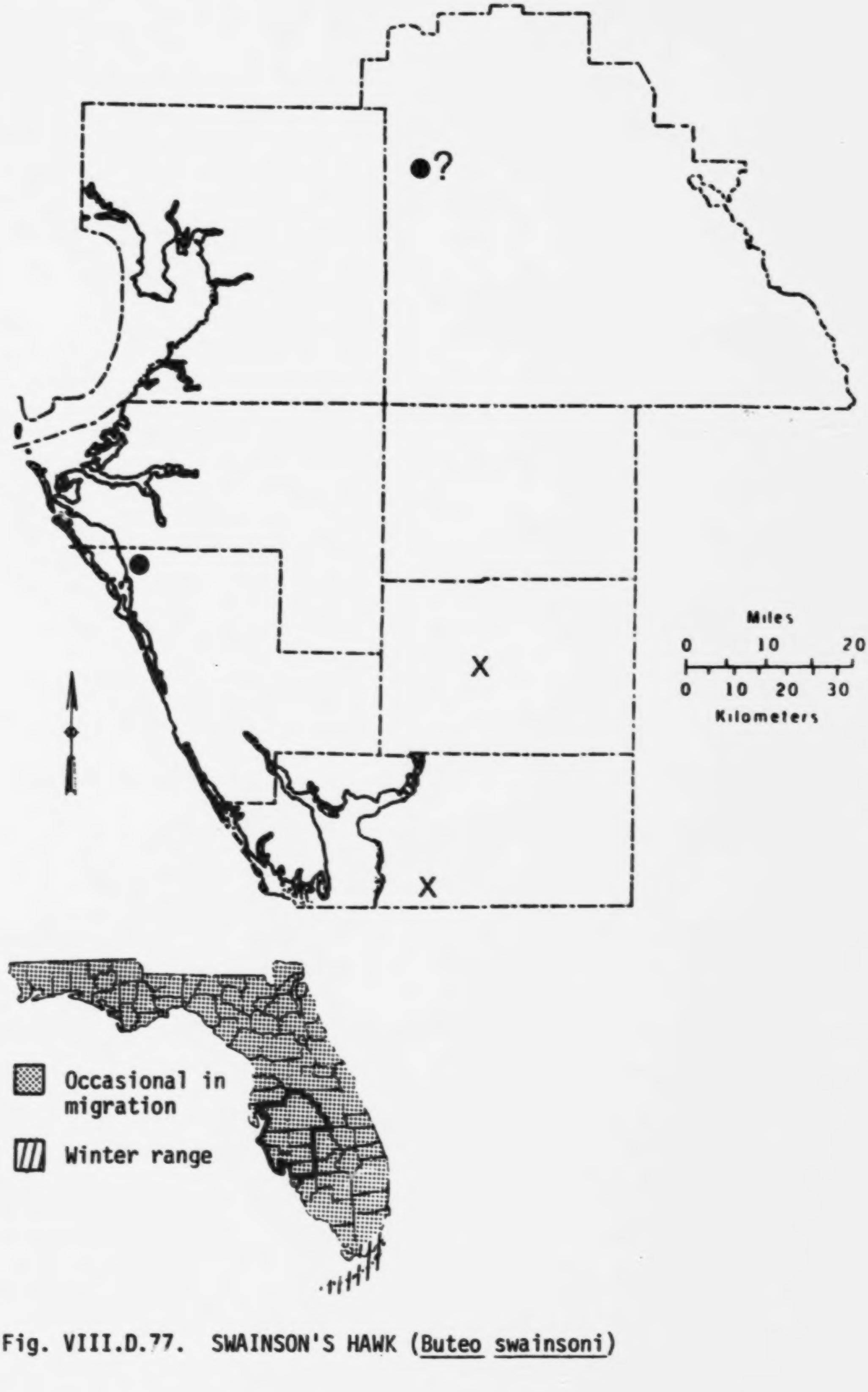

?
Miles
0 10 20
0 10 20 30
Kilometers
X
X
▩ Occasional in migration
▥ Winter range

Fig. VIII.D.77. SWAINSON'S HAWK (*Buteo swainsoni*)

Listed - Threatened, Rare

SHORT-TAILED HAWK Buteo brachyurus Vieillot

Order Falconiformes Family Accipitridae

Other Names: Little Black Hawk (locally applied to the dark color phase)

Distribution: The Short-tailed Hawk is an occasional resident or visitant in the seven-county area. It has been actually reported from five (Charlotte, Hillsborough, Manatee, Polk, Sarasota) of the seven counties. The most recent sightings in the area were in Hillsborough County near the University of South Florida in August 1972 (G. E. Woolfenden pers. comm.) and in the Lakeland area, Polk County, in September 1971 (Robertson 1972) and in November 1976 (J. B. Edscorn pers. comm.), the latter record being based on a somewhat questionable identification. Of nine records in the seven-county area for which dates are available, eight are from late February through October and one is from December. This distribution suggests the species is more frequent in the region in spring, summer, and fall than in winter. Although Short-tailed Hawks have been reported in the region from May through August, there appear to be no confirmed nesting records for the seven-county area. However, J. B. Edscorn (pers. comm.) believes there is a slight possibility that Short-tails may nest in the Green Swamp. Breeding has occurred in adjacent areas. The Short-tailed Hawk has been reported from scattered localities throughout Florida north to a line from about the lower Apalachicola River to the middle St. Johns River and presumably nests throughout this area (Ogden 1976). The Florida population is probably disjunct from other populations of the species. The south Florida birds are sedentary, but the populations of central and north Florida migrate to the southern part of the state (Ogden 1974). The overall species' range includes the tropical, subtropical, and some temperate zones from Mexico southward to northern Argentina (Ogden 1976). The Florida population is referable to the subspecies _B_. _b_. _fuliginosus_, whose range, in addition to Florida, extends from Mexico to Panama (Rand 1960).

Habitat: The only specific information obtained on habitats of the Short-tailed Hawk within the seven-county area are reports by G. E. Woolfenden (pers. comm.) of the birds he observed in cypress-oak mesic hammock and by J. B. Edscorn (pers. comm.) of a bird seen at Saddle Creek Park (Polk County) near a cypress stand. Ogden (1974) stated that the preferred habitat in Florida consists of mixed woodland-savannah. Essential habitat features are suitable stands of large trees for nesting and woodland edges and open country suitable for hunting with the technique of soaring and stooping employed by this species.

Population Status: As the small number of records shows, the species is very rare within the seven-county area. Edscorn (unpubl. MS) considers it an extremely rare visitant in the Lakeland area. No accurate estimate of the size of the total Florida population is available, but there are possibly only a few hundred individuals widely and thinly spread over the peninsula (Ogden 1976). As a result of the distinct intrastate migration, the population is concentrated in south Florida during the winter. The species was first discovered in Florida in 1881 (Howell 1932). Since that time, there appears to have been no major change in its status in the state, although habitats in some areas where it formerly nested have been destroyed (Ogden 1976). The birds may also have been eliminated locally by shooting.

J. B. Edscorn (pers. comm.) observed the apparent shooting of an individual at Saddle Creek Park (Polk County) in 1971.

Basis for Priority Status: This species is listed as Threatened by the Florida Game and Fresh Water Fish Commission and Rare by the Florida Committee on Rare and Endangered Plants and Animals on the basis of the isolation and low numbers of the Florida population and the potential threat to its future status through reduction of nesting habitat by continued destruction of mature cypress and hardwood forests in the central and northern parts of the state.

Potential Impacts of Mining: Because of its infrequent occurrence in the seven-county area and lack of evidence that a significant segment of the isolated Florida population occurs in the area, its status in the area and elsewhere in the state should not be significantly affected by mining. However, any reduction by mining of mature forest cover with large trees adjacent to open areas would reduce the long-term potential carrying capacity of the region for this species. It is unlikely that any of the environments created by reclamation as currently practiced or planned would support Short-tailed Hawks. Even if potentially suitable forest habitats were reestablished, it would take a long period of time before trees attained suitable size for nesting.

Selected References:

*Edscorn, J. B. Birds of the Lake Region. Unpubl. MS.

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

*Ogden, J. C. 1974. The Short-tailed Hawk in Florida. I. Migration, habitat, hunting techniques, and food habits. Auk 91(1):95-110.

*Ogden, J. C. 1976. Short-tailed Hawk, Pages 817-822 _in_ Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

*Rand, A. L. 1960. Races of the Short-tailed Hawk (_Buteo brachyurus_) Auk 77(4):448-459.

*Robertson, W. B., Jr. 1972. Florida region. Am. Birds 26(1):50-54.

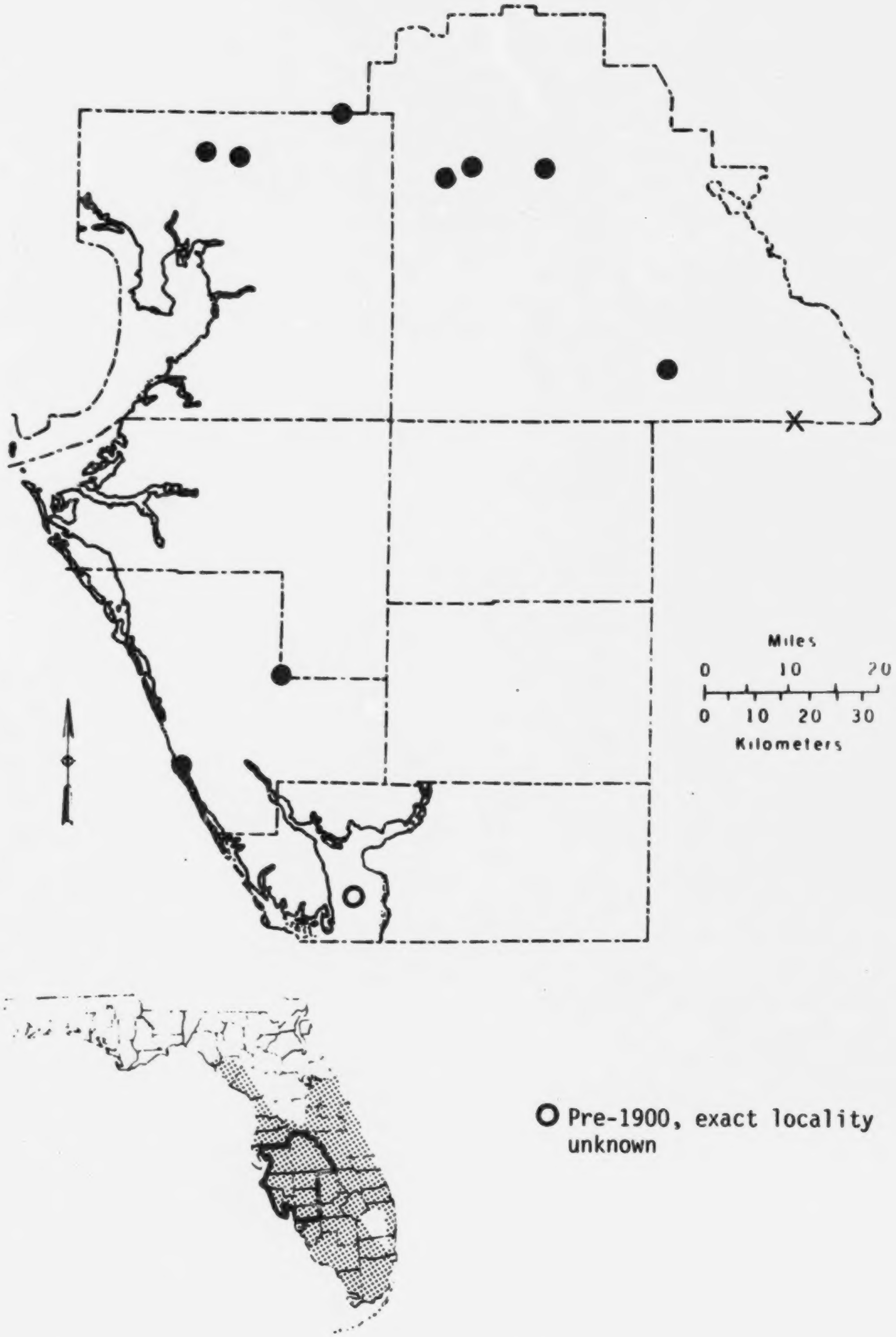

Miles
0 10 20
0 10 20 30
Kilometers
○ Pre-1900, exact locality unknown

Fig. VIII.D.78. SHORT-TAILED HAWK (*Buteo brachyurus*)

Biologically Significant

ROUGH-LEGGED HAWK

Buteo lagopus (Pontoppidan)

Order Falconiformes

Family Accipitridae

Other Names: American Rough-legged Hawk

Distribution: The Rough-legged Hawk has apparently been recorded only once in the seven-county area, and that record is questionable. One was allegedly observed on the 1970-71 Bradenton Christmas Bird Count, but no details were provided and this identification is suspect. Howell (1932) did not list the Rough-legged Hawk as occurring in Florida. However, Sprunt (1954) regarded it as an occasional winter visitor in Florida on the basis of a number of sight records dating from 1938. He even noted an instance of apparent nesting at Lake Okeechobee in May 1938. Although there have been additional sight records in recent years, no specimen has yet been collected in Florida. The Rough-legged Hawk breeds in northern Eurasia and southern United States (Stevenson 1976).

Habitat: In its breeding range, this species is an inhabitant of open country or forests with extensive open ground (Brown and Amadon 1968). No habitat details are available for the individual reported from Manatee County. Elsewhere in Florida the species has been recorded in or near open areas.

Population Status: If it does indeed occur in the seven-county area in winter, this species must be considered an extremely rare and irregular visitant. There is no evidence of any long-term trend in frequency of occurrence in the state as a whole.

Basis for Priority Status: It is considered as biologically significant on the grounds that, as a raptor high on the food chain, the species is a potential indicator of disruption of natural ecosystems. However, because of its rarity in the seven-county area and state as a whole it is of negligible value in this regard.

Potential Impacts of Mining: There is no basis for predicting any effect on the status of this form from mining and associated activities. It is probably as likely to occur sporadically on mined areas or lands reclaimed to grasslands as in present habitats.

Selected References:

*Brown, L., and D. Amadon. 1968. Eagles, hawks and falcons of the world. McGraw-Hill Book Co., New York. 2 vols.

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

*Sprunt, A., Jr. 1954. Florida bird life. Coward-McCann, Inc., New York. 527 pp.

*Stevenson, H. M. 1976. Vertebrates of Florida, identification and distribution. Univ. Presses of Fla., Gainesville. 607 pp.

Biologically Significant

GOLDEN EAGLE Aquila chrysaetos (Linnaeus)

Order Falconiformes Family Accipitridae

Distribution: Two records of the Golden Eagle, possibly of the same individual, are available for the study area, one from DeSoto County, and one about 35 miles away in Manatee County. The first record is of an immature male captured in weakened condition 4 March 1976 on the Bright Hour Ranch on the DeSoto Prairie. It was released there in June, and reported as having been seen nearby by the local ranchers in the fall of the same year (J. N. Layne pers. comm.). The second record is for 4 December 1976 near Myakka River State Park, when the eagle allowed close-enough approach to be photographed (Edscorn 1977). It is not impossible that the DeSoto and Manatee County records are of the same individual.

Elsewhere in Florida, the species is of rare but regular occurrence in the panhandle (Howell 1932), and accidental on the peninsula. Sightings are published from as far south in Florida as Palm Beach (Sprunt 1954) and Collier counties (Sprunt 1963).

In North America, the Golden Eagle breeds across extreme northern Canada, throughout virtually all of Alaska, and south to Mexico on the western half of the continent. It regularly winters in eastern United States north of Florida (Robbins et al. 1966). Though nesting has not been confirmed in southeastern United States, it is suspected for North Carolina and Virginia (Chamberlain 1974).

Habitat: Where known to breed the Golden Eagle frequents remote mountainous country, tundra and deserts. The tundra and northern coniferous forests population of North America migrates south for winter. The wintering population of eastern North America selects the areas with least human disturbance. Golden Eagles capture prey on open ground and are not found along coastlines, therefore their existence in forest habitats requires some open country.

Population Status: The Golden Eagle is extremely rare in the seven-county area and throughout all of peninsular Florida.

Basis for Priority Status: The Golden Eagle is high up in the food chain and as such never exists in great densities. As a predator of birds and mammals the species is an excellent indicator of the status of the ecosystems of which it is a member. Though not listed by the Florida Committee on Rare and Endangered Plants and Animals because of its accidental occurrence in the state, it is included in Rare and Endangered Birds of the Southern National Forests by Chamberlain (1974).

Potential Impacts of Mining: Because of the Golden Eagle's extreme rarity in south central Florida, phosphate mining and reclamation are not likely to affect its status. It is perhaps as likely to appear in unreclaimed mined land or extensive areas restored to grasslands as in existing habitats in the region.

Selected References:

*Chamberlain, E. B. 1974. Rare and endangered birds of the southern national forests. U. S. Dept. of Agriculture, Forest Serv. Southern Region. 108 pp.

*Edscorn, J. B. 1977. Florida birds. Fla. Nat. 50(2):30-31.

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

*Robbins, C. S., B. Bruun, and H. S. Zim. 1966. Birds of North America. Golden Press, New York. 340 pp.

*Sprunt, A., Jr. 1954. Florida bird life. Coward-McCann, Inc., New York. 527 pp.

*Sprunt, A., Jr. 1963. Addendum to Florida bird life. Coward-McCann, Inc., New York. 21 pp.

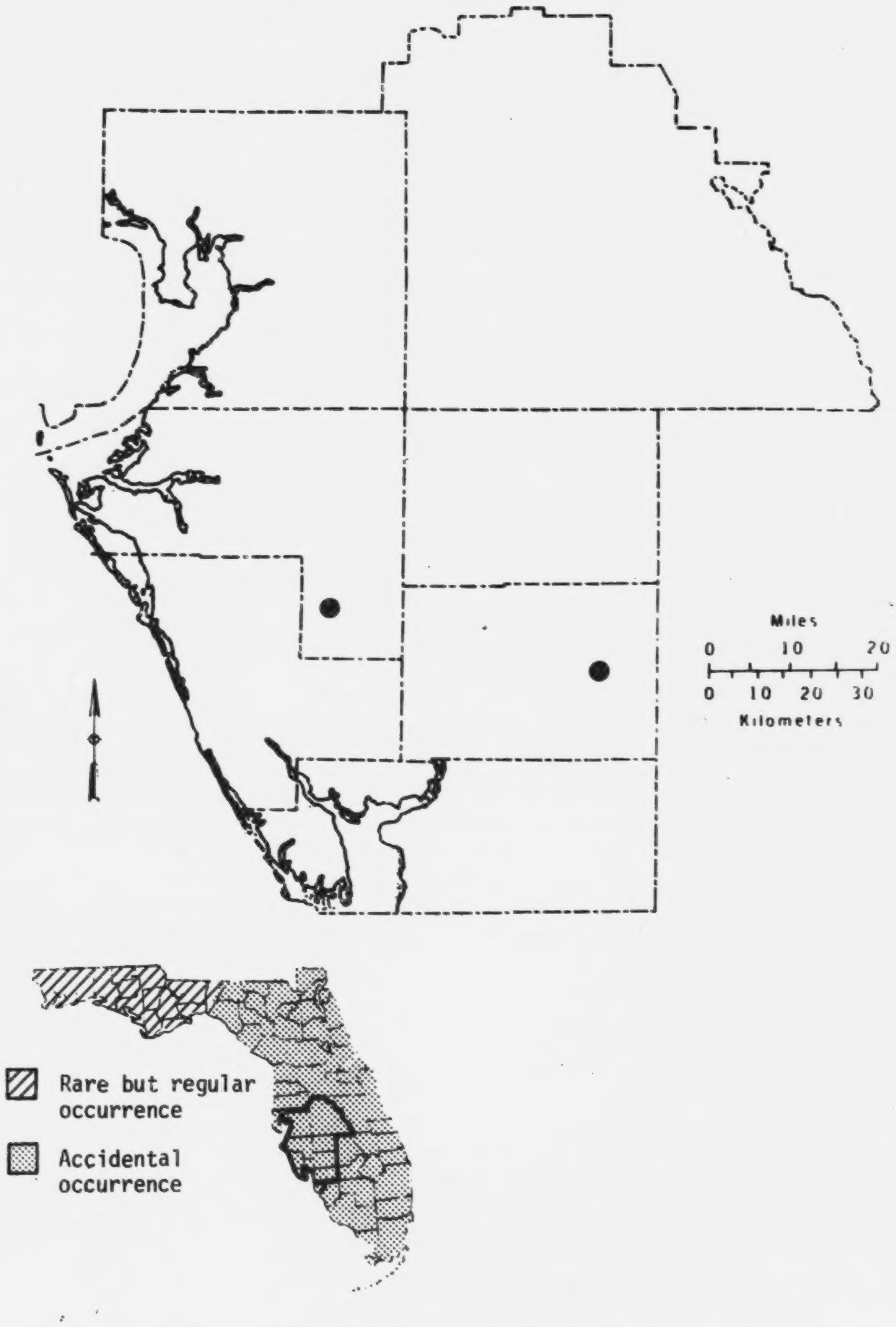

Miles
0
10
20
0
10
20
30
Kilometers
▨ Rare but regular occurrence
▩ Accidental occurrence

Fig. VIII.D.79. GOLDEN EAGLE (*Aquila chrysaetos*)

Listed - Endangered, Threatened

SOUTHERN BALD EAGLE | *Haliaeetus leucocephalus leucocephalus* (Linnaeus)

Order Falconiformes | Family Accipitridae

Other Names: American Eagle

Distribution: The Southern Bald Eagle is a permanent resident generally distributed through the study area. It occurs at many localities in peninsular Florida, but apparently has been eliminated from the Florida panhandle west of the Apalachicola River and from major segments of the peninsula where dense human populations exist.

Present-day principal nesting concentrations are found along the extreme southwest coast and in Florida Bay, along the Gulf coast from Pinellas County to the mouth of the Suwannee River, and along the St. Johns-Oklawaha River system from Brevard County to southern Alachua County. Formerly the Bald Eagle was almost ubiquitous in Florida, nesting from the lower Florida Keys along the entire coastline and near larger lakes and rivers throughout the interior (Robertson 1976).

The Southern Bald Eagle formerly occurred across North America from northern California, New Mexico, Oklahoma, Kentucky, and southeastern Virginia south to the Florida Keys, the Gulf coast, southern Texas, and southwestern United States and Baja California. Now it is gone as a nesting species from most of its former range in the interior and greatly reduced in most coastal areas. Outside of Florida probably fewer than 50 pairs remain (Robertson 1976).

The northern race *H. l. alascanus* ranges through North America south of the arctic tundra and intergrades in a broad belt with the southern race H. l. leucocephalus across the middle United States (Robertson 1976).

Habitat: Though the Southern Bald Eagle has an extensive range, it nearly always resides near large bodies of water, salt or fresh. Figure VIII.D.80 shows the present-day concentration of nest sites and sightings of eagles in the lake region and along the coast. Prior to urbanization, breeding densities along the coast were many times greater than at present (Broley 1947). Fish and a great variety of aquatic birds and turtles are staple foods. A statewide survey of nest sites produced the following results: pines, 60.5 percent; cypress, 14.3 percent; mangrove (3 species), 22.9 percent. Coastal nesting, where pine and cypress are scarce, was mostly in mangroves. A few nests were on the ground or in unidentified dead trees. About two-thirds of the nests were in living trees, the rest in dead or dying trees. Most of the nest sites (60.5 percent) were in open surroundings, 30.4 percent were classed as being in dense cover. Shade over the nest seemed preferred (Nesbitt et al. 1975).

Population Status: Annual breeding begins in November or December. It is at a minimum in late summer when non-adult Southern Bald Eagles are known to wander north (Broley 1947). During the 1976-1977 breeding season 47 active nests were located in the seven-county area (D. W. Peterson pers. comm.). This sample probably represents 90 percent of all active nests (D. W. Peterson pers. comm.), and the following population estimates are based on the convenient figure of 50 active nests, representing 100 breeding adults, in the seven-county area. During the years 1972-1975 reproductive success per pair was 0.82 (Nesbitt et al. 1975). Thus about 41 young would be expected to fledge from the 50 nests in the study area.

Subadults constitute about one-fifth to one-quarter of the total population (based on Nesbitt _et al_. 1975). Assuming the same adult to subadult ratio in the seven-county area would add about 28 to 35 individuals to the total population in the seven counties. Based on the above assumptions, the total _post-breeding_ population of Southern Bald Eagles in the seven counties is approximately 169 to 176 individuals, which constitutes from 17 to 22 percent of the Bald Eagles residing in Florida and a significant portion of all members of the race.

In earlier years the Southern Bald Eagle was almost ubiquitous in Florida, with a total population estimated to have been well in excess of 1000 breeders. The numbers nesting along the middle Gulf and Atlantic coasts of the peninsula were among the densest breeding concentrations of a large raptor in the world (Robertson 1976). Now only about 500 pairs breed in Florida (Nesbitt 1976).

Basis for Priority Status: The Southern Bald Eagle is listed as Endangered by the U. S. Department of Interior, and as Threatened by the Florida Committee on Rare and Endangered Plants and Animals and Florida Game and Fresh Water Fish Commission. It is also listed as Endangered by the International Union for Conservation of Nature and Natural Resources.

Potential Impacts of Mining: The Bald Eagle is completely protected by law, and because it is the national emblem of the United States, it probably enjoys more favor with the public than most other animals in the country. However, legal protection given the bird itself does not extend to the nest sites. Almost daily, development in Florida is obliterating nest sites (Robertson 1976). Phosphate mining and reclamation and all other activities that alter extensive tracts of natural habitat, particularly marshes and aquatic habitats, will have a deleterious effect on eagle breeding and populations. Study is needed of the amount of buffer area needed around active nests to prevent desertion. Many pairs seem reasonably tolerant of nearby human activity, therefore the approach is practical (Robertson 1976). The suitability of reclaimed lands for this species would depend upon the amount and quality of wetland and aquatic habitats provided and availability of suitable nest trees.

Selected References:

*Broley, C. L. 1947. Migration and nesting of Florida Bald Eagles. Wilson Bull. 59(1):3-20.

*Nesbitt, S. A. 1976. The Bald Eagle. Fla. Nat. 49(6):14-17.

*Nesbitt, S. A., R. Roth, and W. B. Robertson, Jr. 1975. The status of the Bald Eagle in Florida 1972-1975. Fla. Coop. Bald Eagle Survey Comm. 6 pp.

*Robertson, W. B., Jr. 1976. Southern Bald Eagle, Pages 735-745 in Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

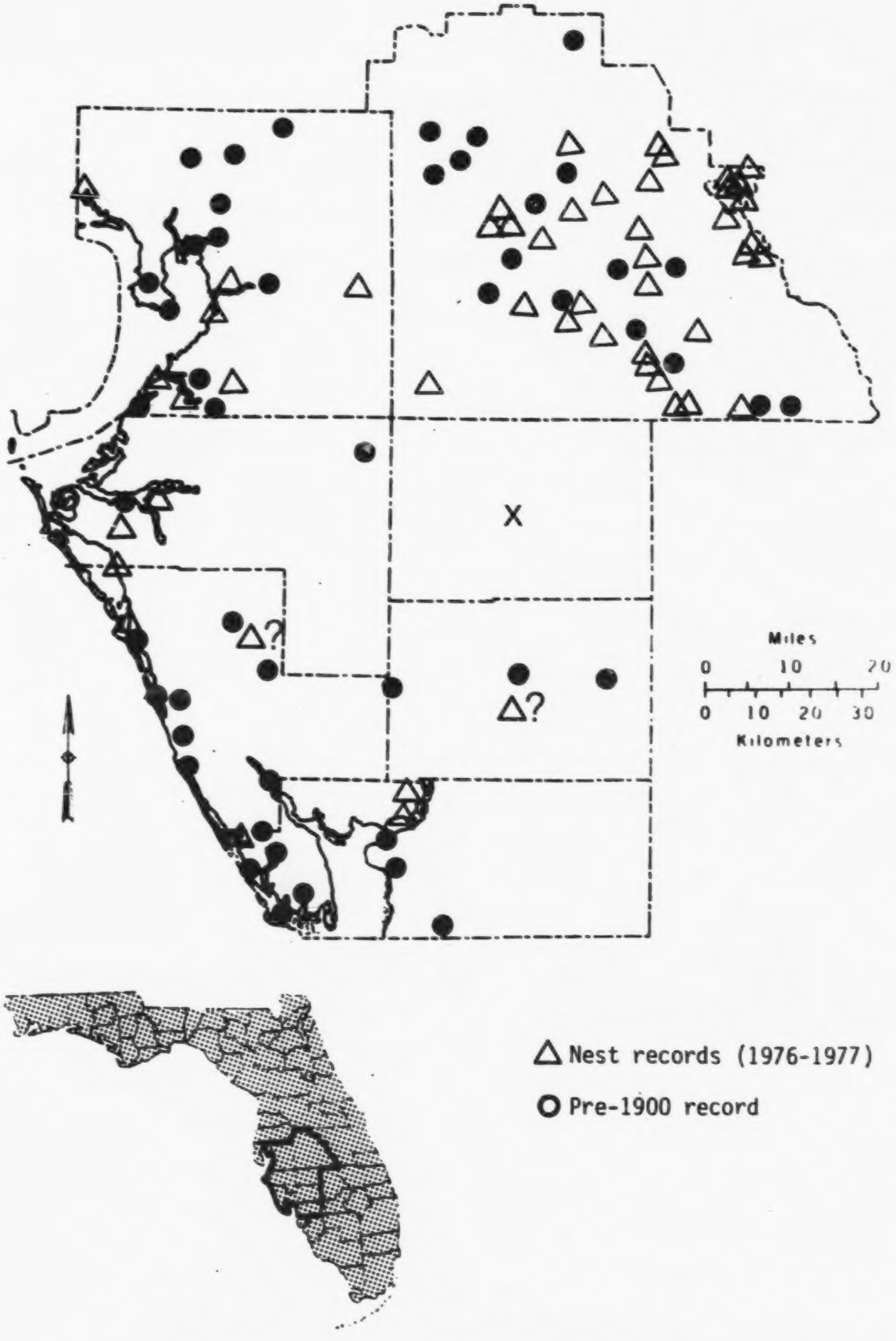

X
△?
△?
Miles
0
10
20
0
10
20
30
Kilometers
△ Nest records (1976-1977)
● Pre-1900 record

Fig. VIII.D.80. SOUTHERN BALD EAGLE (*Haliaeetus leucocephalus leucocephalus*)

Listed - Blue List

MARSH HAWK — *Circus cyaneus* (Linnaeus)

Order Falconiformes — Family Accipitridae

Distribution: Specific locality records exist for the Marsh Hawk from all seven counties in the study area. The Marsh Hawk occurs throughout Florida from September to May. It is extremely rare in summer, but recent records do exist (Layne and Douglass 1976). The species breeds in northern and far western United States and in Canada south of the arctic tundra. It winters throughout most of United States and south into Mexico and the West Indies (Robbins *et al*. 1966).

Habitat: As the name implies, this raptor inhabits open country. Salt marshes and interior wetlands, including extensive settling pond marshes, are preferred; dry prairies and pastures also are used. The bird feeds by pouncing on small mammals and birds located by coursing over open habitats.

Population Status: The Marsh Hawk is an uncommon winter resident and migrant in the seven-county area. Significant decline in numbers is suspected during the 1960's (J. B. Edscorn pers. comm.). During the six years 1972-1977 the McKay Bay area has been censused annually by one party with the same leader during winter and from dawn until noon. Marsh Hawks were seen five of the six years, their numbers ranging from one to four (mean = 1.7). The McKay Bay area includes about one square mile of Marsh Hawk foraging habitat. The Archbold Biological Station Roadside Census data suggest a stable population during recent winters (Table VIII.D.10).

Basis for Priority Status: The Marsh Hawk is included on the 1977 Blue List of the National Audubon Society. The most recent polling resulted in 74 percent of the respondents favoring its inclusion (Arbib 1977).

Potential Impacts of Mining: Draining interior and coastal wetlands will eliminate the natural habitats of Marsh Hawks. Changing forested areas into pastures, and producing extensive marshes in settling basins will provide Marsh Hawk habitat. The relative importance of natural versus artificial habitats and coastal versus inland habitats remains unknown.

Selected References:

*Arbib, R. 1977. The Blue List for 1977. Am. Birds 30(6):1031-1039.

*Layne, J. N., and J. F. Douglass. 1976. Summer records of the Marsh Hawk in Florida. Fla. Field Nat. 4(1):19-21.

*Robbins, C. S., B. Bruun, and H. S. Zim. 1966. Birds of North America. Golden Press, New York. 340 pp.

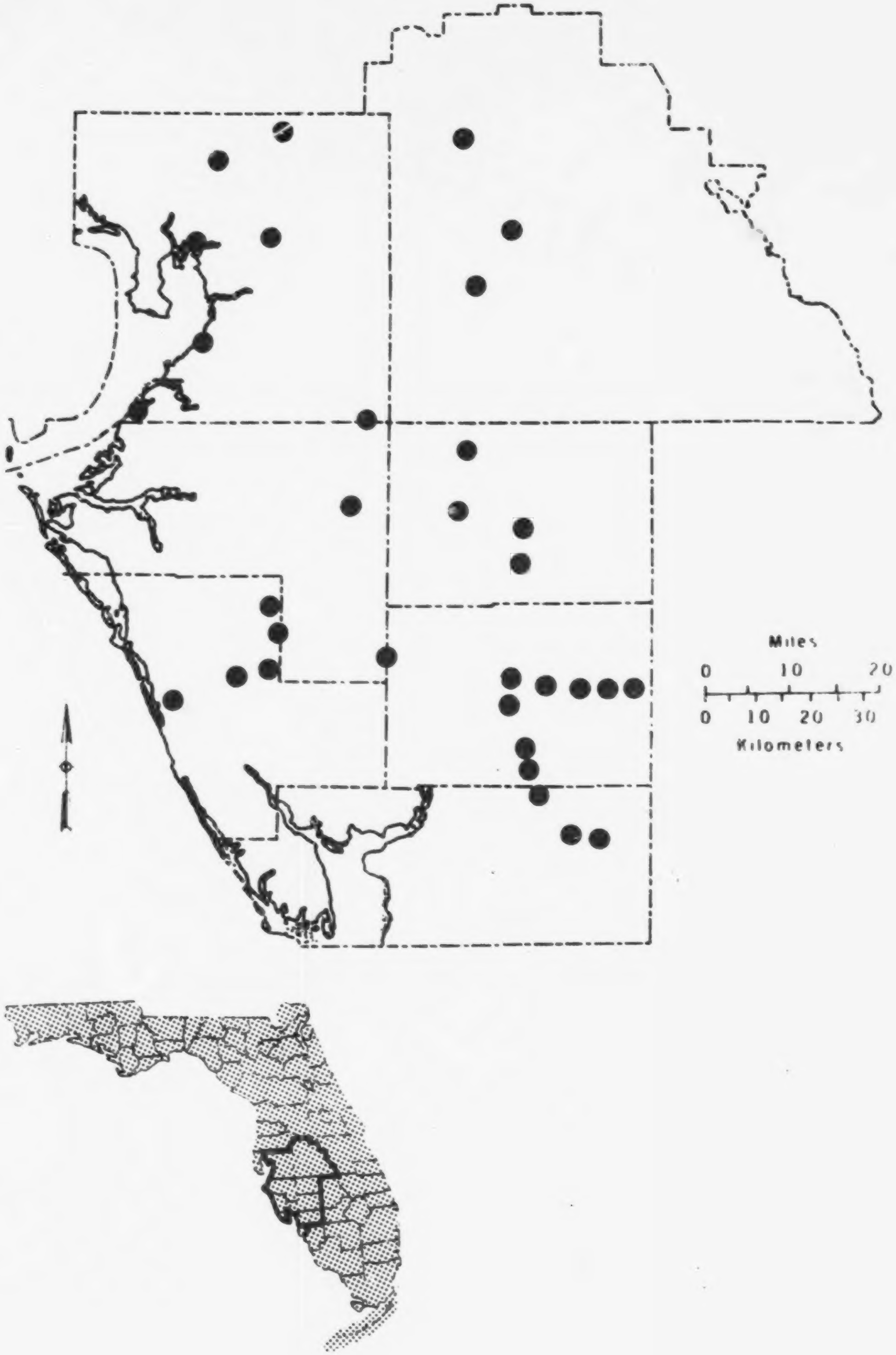

Miles
0
10
20
0
10
20
30
Kilometers

Fig. VIII.D.81. MARSH HAWK (*Circus cyaneus*)

Listed - Threatened, Blue List

OSPREY *Pandion haliaetus carolinensis* (Gmelin)

Order Falconiformes Family Pandionidae

Other Names: Fish Hawk

Distribution: Ospreys have been sighted in all seven counties of the study area, with specific localities on record for Charlotte, Hillsborough, Manatee, Polk and Sarasota. Nearly worldwide in distribution, especially in the northern hemisphere, the Osprey occurs throughout Florida and North America north of Mexico and south of the arctic tundra (Brown and Amadon 1968). South Florida Ospreys are permanent residents; the bulk of the North American population including north and central Florida birds winter south of the United States. Ospreys in south Florida nest during winter and early spring (Ogden 1976). Ospreys in the study area nest in early spring; the local residents begin to disappear in July and August and most are gone by September (J. B. Edscorn pers. comm.).

Habitat: Ospreys feed mostly on fish, which they capture in their talons. Nests usually are placed in tops of large living or dead cypress, pine, or swamp hardwood trees which are located near sea coasts, interior lakes, large swamps, or large rivers. Nests may be close to or on the ground in areas remote from nest predators. Man-made structures such as utility poles, radio towers, channel markers (Schreiber and Schreiber 1977) and structures built for nesting Osprey often are used as nest sites. These often are reused if not disturbed (Ogden 1976).

Population Status: The Osprey is locally common in the study area from early spring through fall. A few individuals winter at localities along the coast or inland near phosphate settling basins and adjacent lakes (J. B. Edscorn pers. comm.). Comparison of numbers of Osprey seen near Tampa, summer and winter, support these generalizations (Table VIII.D.11). Based primarily on field work done south of the seven-county area, it was concluded that Florida populations did not suffer the reproductive decline typical in other regions in North America. Though numbers are not available, sizable nesting populations are known from Charlotte Harbor (Schreiber and Schreiber 1977), Myakka River State Park (Fla. Dept. Nat. Res. 1976), Cockroach Bay in Tampa Bay (F. M. Dunstan pers. comm.), Lower Hillsborough Flood Detention Area (Woolfenden 1974), Panther Point near Lakeland (J. B. Edscorn pers. comm.) and at numerous localities along the Gulf coast (J. N. Layne, G. E. Woolfenden pers. comm.).

Basis for Priority Status: The Osprey is listed as Threatened by the Florida Committee on Rare and Endangered Plants and Animals and the Florida Game and Fresh Water Fish Commission and is on the 1977 Blue List of the National Audubon Society. The environmental factors that have caused the decline are harmful pesticides, loss of habitat to human development and wanton shooting. Reproductive success has increased slightly in a few areas following the recent ban on DDT and certain other pesticides.

Potential Impacts of Mining: Reduction of interior wetlands by mining activities may have a negative effect on the status of the Osprey in the seven-county area, but destruction of forests bordering lakes or streams where the species often nests would be more serious. Settling ponds and other water bodies created by mining and reclamation, assuming they provide conditions for successful fishing and nearby nesting, would be utilized by

Ospreys. It is conceivable that a significant increase in such artificial aquatic habitats would result in a higher interior Osprey population than is now present in the seven-county area. Degradation of natural estuaries such as Tampa Bay and Charlotte Harbor by direct or indirect effects of mining could reduce coastal populations through reduction of fish populations.

Selected References:

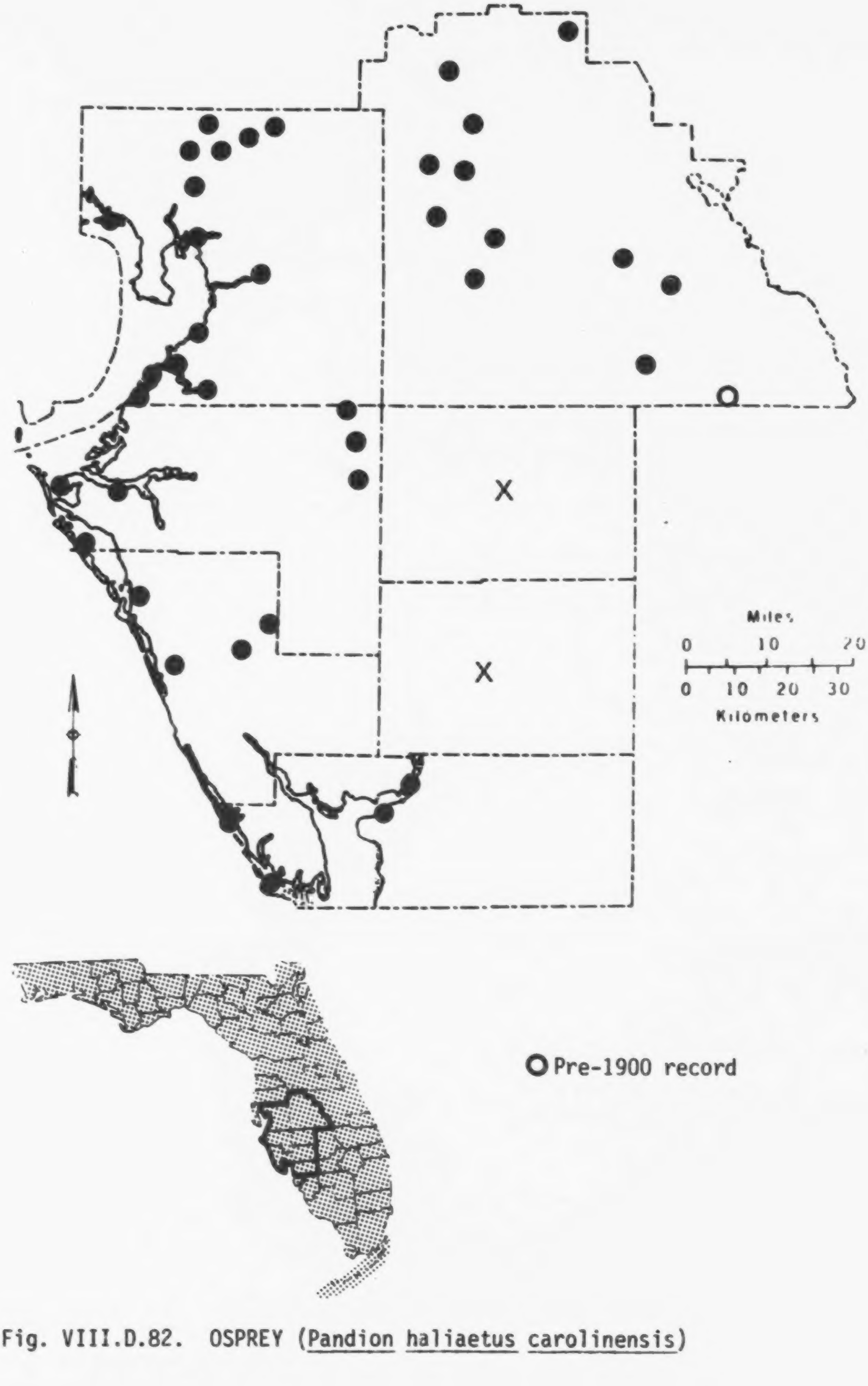
*Brown, L., and D. Amadon. 1968. Eagles, hawks and falcons of the world. McGraw-Hill Book Co., New York. 2 vols.

*Florida Department of Natural Resources. 1976. Vertebrates of Myakka River State Park. 26 pp.

*Ogden, J. C. 1976. Osprey, Pages 746-751 in Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

*Schreiber, R. W., and E. A. Schreiber. 1977. Observations of Ospreys nesting on artificial structures in Charlotte Harbor, Florida. Fla. Field Nat. 5(1):5-7.

*Woolfenden, G. E. 1974. Bird habitat distribution and population estimates, Pages 54-66 in Cowell, B. C., et al., Biological assessment of the Lower Hillsborough Flood Detention Area for recommendation of ecologically based land management. Univ. of So. Fla., Tampa. 111 pp.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○ Pre-1900 record

Fig. VIII.D.82. OSPREY (*Pandion haliaetus carolinensis*)

Listed - Threatened, Blue List

AUDUBON'S CARACARA — Caracara cheriway audubonii (Cassin)

Order Falconiformes — Family Falconidae

Other Names: Crested Caracara, Mexican Buzzard, Mexican Eagle. According to Amadon (1954) the correct scientific name of this species is Polyborus plancus. The race in Florida would thus be known as P. p. auduboni. The scientific name employed in this account is that used in the most recent American Ornithologists' Union Check-list (1957).

Distribution: The Caracara has been recorded in each of the counties of the seven-county area, but it is probably not a permanent resident in Hillsborough County. It is more prevalent inland than along the coast, and the focus of its distribution in the seven-county area is in the Osceola Plain region of Polk County and the DeSoto Plain in Charlotte, DeSoto, Hardee, Manatee, and Sarasota counties. Comparison of locality records from time periods pre-1942, 1967 to 1970, and 1973-1977 does not indicate any obvious long-term change in overall distribution within the seven-county area. The subspecies C. c. audubonii has a disjunct distribution, with isolated populations in Florida and Cuba and the Isle of Pines, and the main population in the southwestern United States, Mexico, and Central America (Layne 1976). In Florida, the Caracara occurs mainly in the south central part of the peninsula southward from about Bradenton, Orlando, and Merritt Island to a line extending roughly from Naples (Collier County) northeast to Jupiter (Palm Beach County) (Howell 1932). It has been recorded, presumably as a wanderer, as far north in the state as Nassau County and south to Homestead and the Keys (Layne 1976, J. N. Layne unpubl. data). There is a possibility that some of these peripheral records may represent escapees. The western segment of the range extends from southern Texas, southern Arizona, and northern Baja California south to western Panama (Brown and Amadon 1968). It has been recorded as an accidental in Jamaica and from as far north as Ontario. Other races of the species occur on the Tres Marias Islands off the west coast of Mexico and from eastern Panama south to the Falkland Islands.

Habitat: The Caracara is a bird of open country. Its primary habitat in Florida is dry prairie with intermittent marshes and scattered cabbage palms or cabbage palm-live oak hammocks. Nests are usually in cabbage palms. The species is also being increasingly found in open improved pasturelands. Often such pastures were originally pine flatwoods habitat, and scattered individual trees or denser stands of pines may still be present. Caracaras occasionally occur in more closed areas with relatively extensive woodlands and more restricted grasslands, and there have been scattered records of pairs, groups, or individuals in coastal mangroves or beach areas (Layne 1976, J. N. Layne unpubl. data). Some of the birds that have turned up in coastal habitats may have escaped from captivity. There is a single record of one individual in the phosphate mine area of Polk County (along U. S. 17 between Ft. Meade and Bartow) about 1975 (R. H. Cantrell pers. comm.).

Population Status: The Caracara is generally rare in the seven-county area, particularly in the more northerly portions. Edscorn (unpubl. MS) listed it as of questionable occurrence in the Lakeland area, and Baynard (1942a) and Stevenson (1967) stated that it is only an occasional visitor in summer at Hillsborough River State Park. Within the seven-county area, the species is most abundant in the prairie areas of Charlotte, DeSoto and Hardee counties. Because of the low number of sightings of this species, data from the Christmas Bird Counts (Tables VIII.D.5, 6), Breeding Bird Surveys (Tables VIII.D.7, 8), and Archbold Biological Station Roadside Censuses (Tables VIII.D.9, 10) provide little information on the present population status or seasonal or long-term trends. Counts by J. N. Layne (unpubl. data) of Caracaras in the seven-county area from 1973 to 1976 are summarized in Table VIII.D.12. These figures are based on ground and aerial surveys of the area and reports from numerous observers. The minimum numbers of individuals recorded over the four-year period ranged from 25 in 1976 to 41 in 1974, with an overall mean of 28. Immatures comprised 21 percent of the birds that were aged. The number of Caracaras estimated in the seven-county area is about 10 percent of the current minimum estimate, about 300 individuals, of the total state population. Based upon repeated records of adults or adults and young in the same locality, there appear to be at least 24 to 27 established territories in the seven-county area, which represent about one-fourth of the minimum estimate of about 100 active territories in the state as a whole (J. N. Layne unpubl. data). There is no obvious seasonal trend in population levels, although records of Caracaras in extreme south Florida have been predominantly in fall and winter, and concentrations of individuals also have more often been observed during this period of the year.

Although there are no good data on the original distribution and abundance of the Caracara in the seven-county area, the available information suggests that there has been an overall long-term decline in numbers, with the population being relatively stable or even experiencing a modest increase in recent years. In Myakka River State Park, Van Duyn in 1941 regarded the Caracara as a common resident and Baynard (1942b) mentioned that the species was "increasing nicely", inferring that it was not then uncommon. Six individuals were believed resident in the park at the time of the 1947-48 Christmas Bird Count. Roy Brooks (pers. comm.) spent several months as an employee at Myakka River State Park in 1935, was there continuously from 1939 to 1941, and has made periodic visits since that time to the present. According to this observer, Caracaras were present in the Myakka River State Park area in some numbers, although not really abundant, up to 1941, but in later years he has seen fewer. In the most recent checklist of the vertebrates of the park (Fla. Dept. Nat. Res. 1976), the Caracara is listed as rare. Data on distribution and numbers of Caracaras in Florida gathered by George Heinzmann from 1967 through 1970 (Archbold Biological Station files) contain records of birds in nine localities within the seven-county area (Fig. VIII.D.83). As noted above, present population estimates are appreciably higher.

The statewide population of the Caracara appears to show a parallel trend to that postulated for the seven-county area. Although there has not been any drastic decrease in the range, numbers in areas such as the Kissimmee Prairie and DeSoto Plain (Arcadia Prairie) are now apparently appreciably below their early historical level, but have stabilized or are actually increasing from a low point in the 1950's and 1960's. In 1970, Heinzmann (1970) estimated the total state population at no more than 100 birds in about 58 localities, whereas the current minimum estimate is about 300 individuals from many more localities (J. N. Layne unpubl. data). Although present data suggest that the population has increased since the late 1960's and early 1970's, it is doubtful if the total number of birds in the state was ever as low as 100 individuals. Since Heinzmann's study, additional records of active territories during the 1967-1970 period have come to light.

Basis for Priority Status: This species is listed as Threatened by the Florida Game and Fresh Water Fish Commission and the Florida Committee on Rare and Endangered Plants and Animals and included on the 1977 Blue List of the National Audubon Society on the basis of the general long-term decline in its numbers, its current relative scarcity, and present land use trends which are reducing its habitats. Shooting and highway mortality are other factors limiting the abundance of the species.

Potential Impacts of Mining: Based upon the location of phosphate reserves presently considered for mining, the bulk of the Caracara population in the seven-county area would not be potentially impacted by mining. Within the region where mining is presently anticipated, loss of improved pastures, native prairie, and other open grassland habitats by mining would most likely eliminate any resident Caracaras. Based on the presently known distribution, a maximum of about five of the 24 to 27 territories in the seven-county area would be potentially at risk. If suitable nest sites and adequate food resources were available, Caracaras should be able to occupy unreclaimed, early successional mined lands and reclaimed areas developed into improved pastures.

Selected References:

*Amadon, D. 1954. On the correct names of the Caracaras and for the

Long-winged Harrier. Auk 71:203-204.

*American Ornithologists' Union. 1957. Check-list of North American birds. The Lord Baltimore Press, Baltimore, Maryland. 691 pp.

*Baynard, O. E. 1942a. The birds of Hillsborough River State Park. Fla. Park Serv. 18 pp.

*Baynard, O. E. 1942b. A check-list of birds Myakka River State Park. Fla. Forest and Park Serv. 15 pp.

*Brown, L., and D. Amadon. 1968. Eagles, hawks and falcons of the world. McGraw-Hill Book Co., New York. 2 vols.

*Edscorn, J. B. Birds of the Lake Region. Unpubl. MS.

*Florida Department of Natural Resources. 1976. Vertebrates of Myakka River State Park. 26 pp.

*Heinzman, G. 1970. The Caracara survey: a four year report. Fla. Nat. 43(4):149.

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

*Layne, J. N. 1976. Caracara, Pages 757-763 _in_ Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

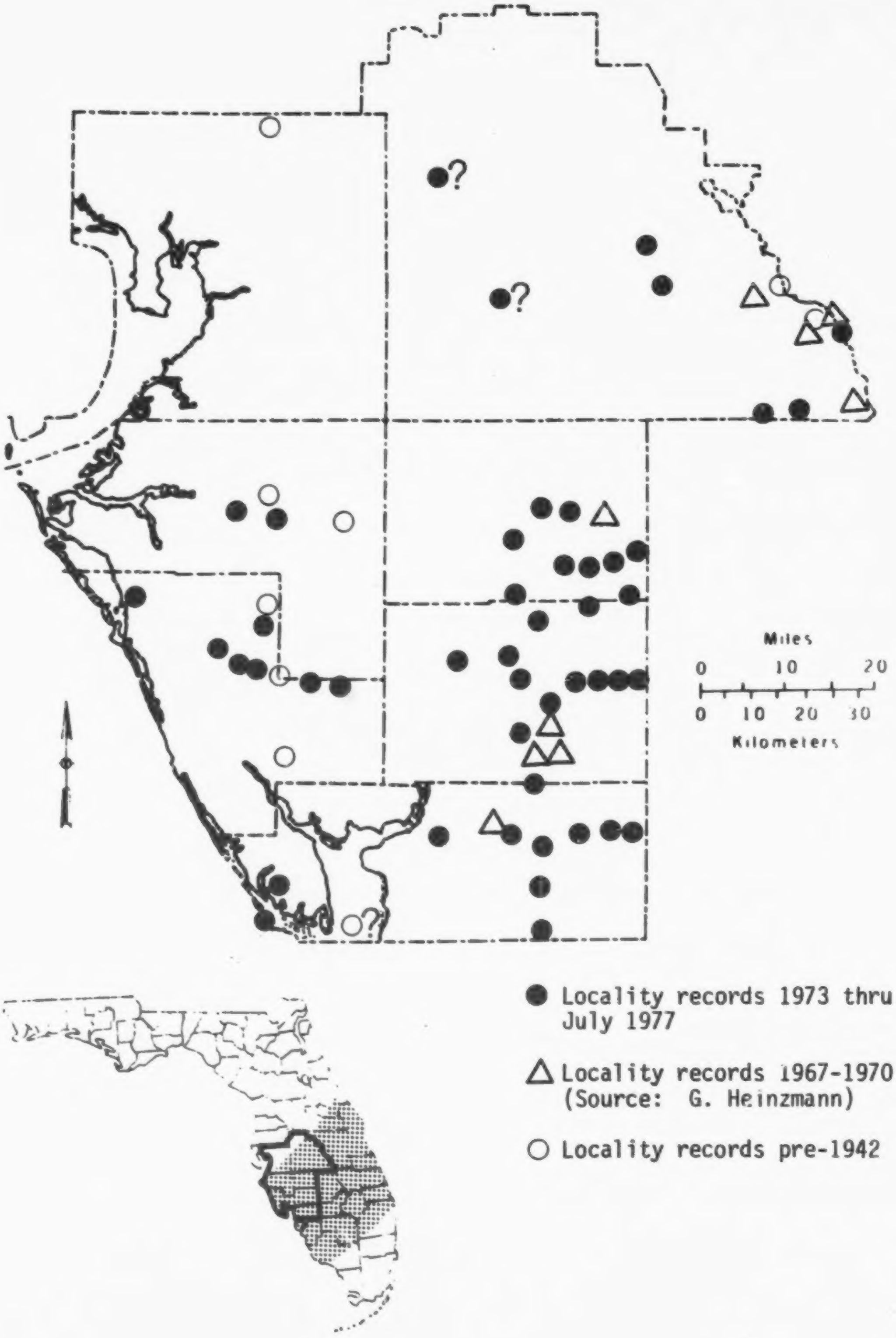
*Stevenson, J. A. 1967. A list of the vertebrates identified in Hillsborough River State Park. Fla. Brd. of Parks. 16 pp.

*Van Duyn, G. 1941. Progress report of biological reconnaissance Myakka River State Park, Florida (FLA SP-4) with preliminary checklists of vertebrate fauna. 25 pp.

Table VIII.D.12. Counts of caracaras in the seven-county area 1973-1976. Numbers in parentheses are estimated total numbers of adults and all individuals based on the assumption that all adults are paired, even though only one adult may have been observed on any one occasion at a given locality. Abbreviations are as follows: A = adult; I = immature; U = age not known.

County	Years															
	1973				1974				1975				1976			
	A	I	U	Tot.	A	I	U	Tot.	A	I	U	Tot.	A	I	U	Tot.
Charlotte	5(6)	-	-	5(6)	6(8)	1	2	9*(11)	3(6)	1	-	4(7)	4(6)		1	5(7)
DeSoto	2(4)	1	4	7(9)	8(10)	3	-	11(13)	6	3	-	9	7(8)	5	1	13(14)
Hardee	6(8)	2	1	9(11)	2	1		3	5(6)	1	-	6(7)				
Hillsborough	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-
Manatee	-	-	-	-	1(2)	-	-	1(2)	2	-	-	2	2	-	-	2
Polk	2?			2?	3(4)	-	2	5(6)	1(2)	-	4	5(6)	-	-	1	1
Sarasota	1(2)	-	2	3(4)	4(6)	-	-	4(6)	-	-	2	2	-	-	1	1
	16(22)	3	7	26(32)	24(32)	5	4	33(41)	17(22)	6	6	29(34)	13(16)	5	4	22(25)

* Does not include a group of 18 or more caracaras observed at north end of Gasparilla Island.


Miles
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0
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Kilometers
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● Locality records 1973 thru July 1977

△ Locality records 1967-1970 (Source: G. Heinzmann)

○ Locality records pre-1942

Fig. VIII.D.83. AUDUBON'S CARACARA (Caracara cheriway audubonii)

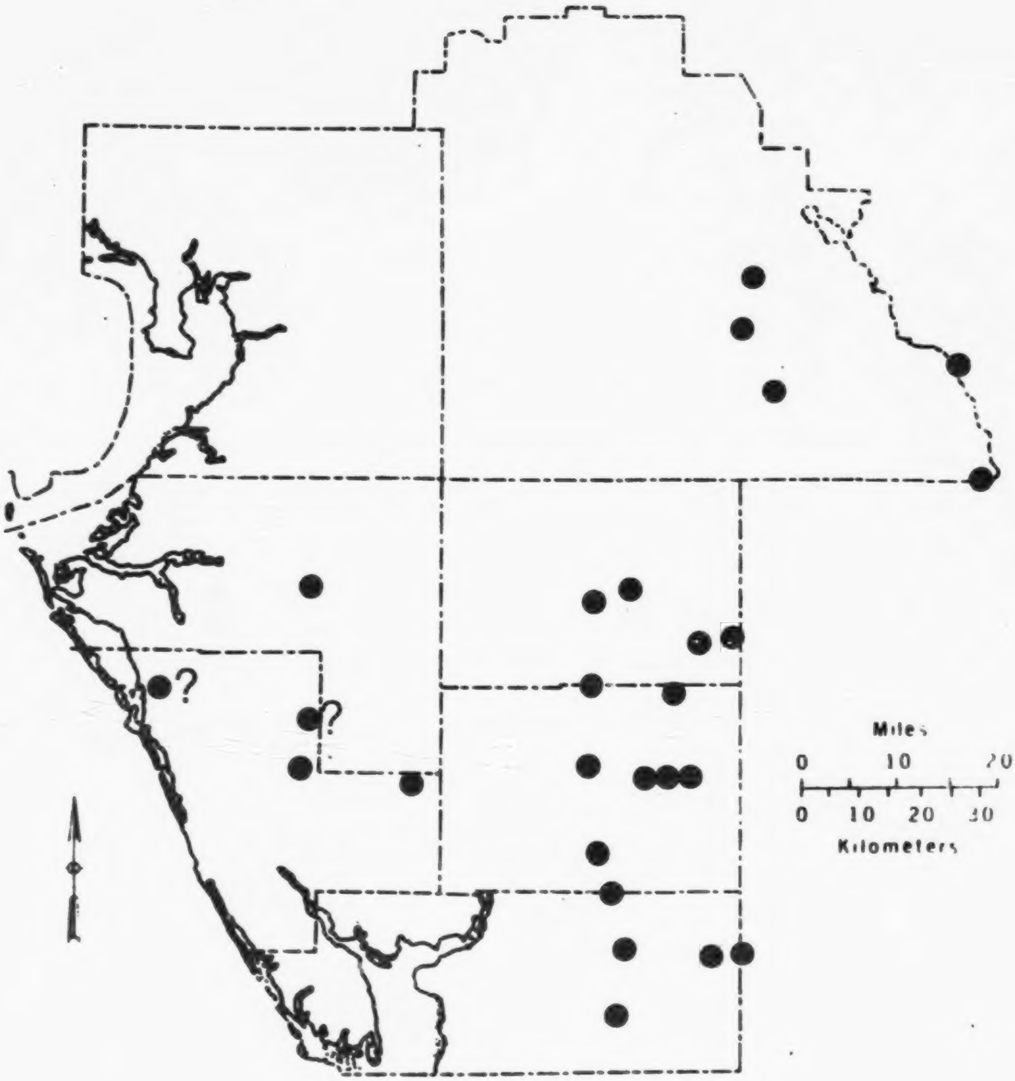

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Fig. VIII.D.84. AUDUBON'S CARACARA (Caracara cheriway audubonii). Estimated minimum number of established pairs as of July 1977.

Listed - Endangered

PEREGRINE FALCON | *Falco peregrinus* Tunstall

Order Falconiformes | Family Falconidae

Other Names: Duck Hawk

Distribution: Records of the Peregrine exist for four counties in the study area, namely those that have received the most attention by bird observers. The Peregrine Falcon occurs throughout Florida as a migrant, and at scattered localities as a winter resident, appearing in September and leaving in April.

As a breeder, the Peregrine has been recorded from all states except Florida and Ohio. However, most breeding records antedate the 1940's. The species' present breeding range is extremely reduced, with no breeding in the eastern United States and breeding at only scattered localities in the western United States. Its distribution in Florida is unchanged.

Habitat: The Peregrine Falcon requires open country for hunting. In Florida, Peregrines concentrate where shorebirds, waterfowl, and waders are abundant. Here they rest, roost, feed and preen on exposed perches such as dead trees and utility poles. They feed mostly on birds, which they capture in flight. In the interior of the seven-county area, Peregrines have been observed hunting over extensive slime settling ponds in mining areas of Polk County (J. B. Edscorn pers. comm.).

Population Status: The Peregrine Falcon is a rare migrant and very rare winter resident. It has been seen much less frequently in recent decades than in earlier years.

The breeding population in the United States is rather well known, with only about 20 pairs in existence, all in the West (Braun et al. 1977).

Extensive research has documented that certain pesticides such as DDT contributed to the decline of this top carnivore through alteration of physiological systems involving calcium leading to egg-shell thinning. Indications of improvement in reproduction have followed the reduced use of these chemicals. An intensive breeding and restocking program is presently underway (Cade 1974).

Basis for Priority Status: The Peregrine Falcon is listed as Endangered by the U. S. Department of Interior, the Florida Game and Fresh Water Fish Commission, the Florida Committee on Rare and Endangered Plants and Animals, and the International Union for Conservation of Nature and Natural Resources. An esthetically magnificent animal and the most coveted raptor used in falconry, the Peregrine deserves strict protection.

Certain localities in Florida are, or potentially are, important rest stops for migrants and feeding areas for wintering individuals. Unnatural dangers at these locations include wanton shooting (Snyder 1976).

Potential Impacts of Mining: Inland activities are not likely to have deleterious effects on Peregrine populations. Conceivably, areas with extensive aquatic habitats attractive to waterfowl and shorebirds such as Orange Park in Polk County would be attractive to migrants and winterers. Three of four sightings by J. B. Edscorn (pers. comm.) in Polk County have been from mining settling ponds. Coastal activities resulting in the destruction of natural estuaries would reduce Peregrine habitat. The most recent record of a Peregrine in the study area, and perhaps for all of Florida, was of an adult that wintered at McKay Bay in Hillsborough County in 1974. The bird was seen from December until February. Twice it was observed to capture one of the thousands of shorebirds that winter on the mudflats there (G. E. Woolfenden pers. comm.).

Selected References:

*Braun, C. E., J. H. Enderson, C. J. Henny, H. Meng, and A. G. Nye, Jr. 1977. Falconry: effects on raptor populations and management in North America. Wilson Bull. 89(2):360-369.

*Cade, T. J. 1974. Plans for managing the survival of the Peregrine Falcon, Pages 89-104 in Management of raptors. Raptor Res. Rept. No. 2.

*Snyder, H. 1976. Peregrine Falcon, Pages 677-682 in Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

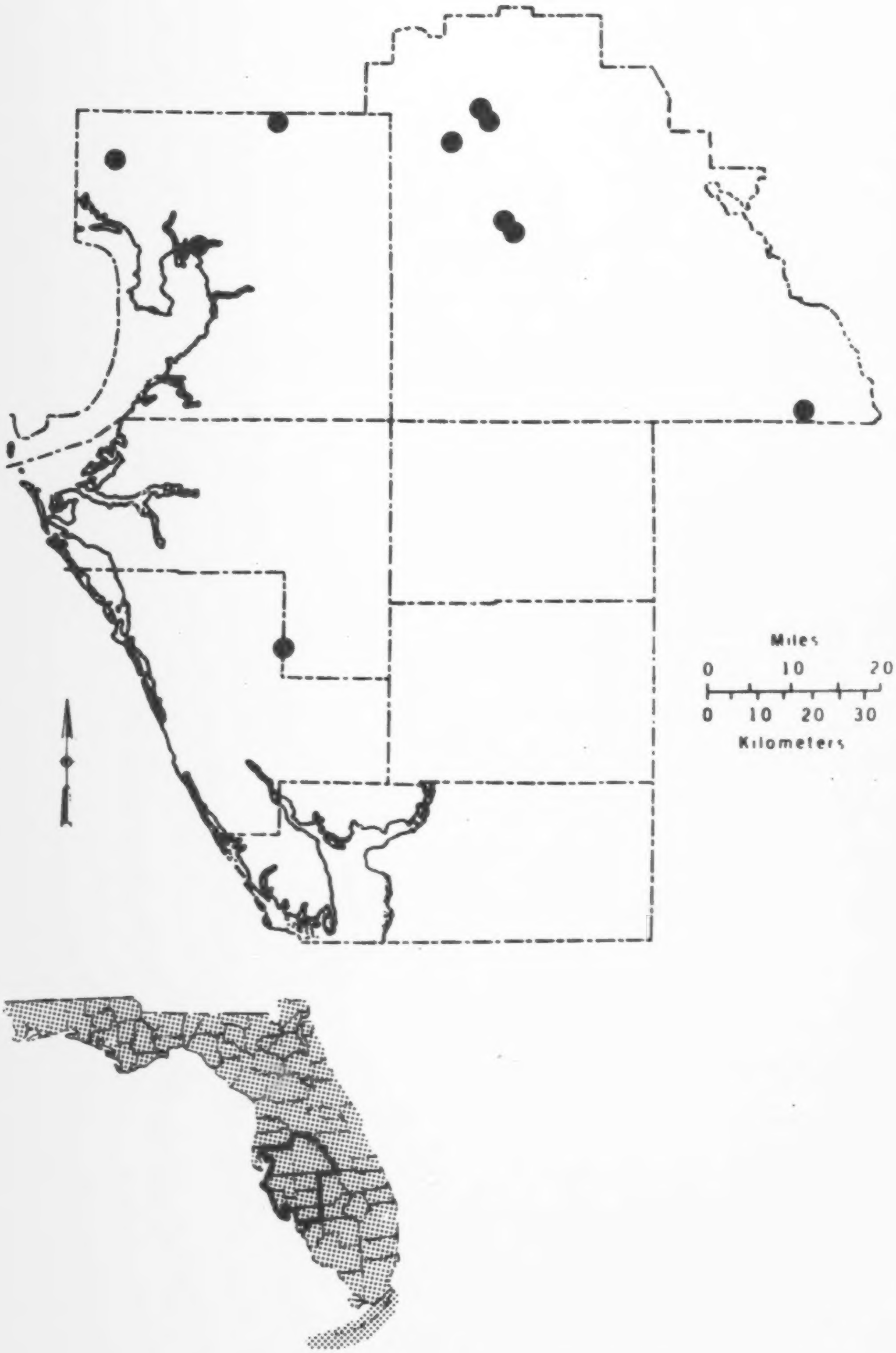
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Fig. VIII.D.85. PEREGRINE FALCON (*Falco peregrinus*)

Listed - Status Undetermined, Blue List

MERLIN — *Falco columbarius* Linnaeus

Order Falconiformes — Family Falconidae

Other Names: Pigeon Hawk

Distribution: Merlins are recorded in the study area from DeSoto, Hillsborough, Manatee, Polk and Sarasota counties, with specific localities known for four of these counties, the exception being DeSoto. A transient and winter resident, the Merlin occurs in Florida from September through April. A dying, banded individual found 16 October 1973 at Ruskin (Hillsborough County) had been banded near Cape May, New Jersey on 28 September 1973 (G. E. Woolfenden pers. comm.).

Breeding in the coniferous forests of Canada and the northwestern United States, the species winters on the Atlantic coastal plain and the southwestern United States on south into South America (Robbins *et al*. 1966, Wiley 1976).

Habitat: Though breeding in forested areas, the swift flying Merlin forages in open country. In Florida it frequents seashores, marshlands and edges of open woodlands. In January 1977 in nearby Pinellas County an individual was seen for several days living near a dairy cow pasture and feeding on the blackbirds that assembled there in large numbers.

Population Status: The Merlin is uncommon in the seven-county area. It occurs most frequently in fall (October) and along the coast. It is a rare winter resident. A decline in sightings occurred in the late 1960's and early 1970's, but more recently Merlins have shown a slight increase (J. B. Edscorn and G. E. Woolfenden pers. comm.). Pesticide contamination, some probably obtained from prey taken on the wintering grounds south of the United States, is a probable partial cause for the decline (Wiley 1976).

Basis for Priority Status: Listed as Status Undetermined by the Florida Committee on Rare and Endangered Plants and Animals, the Merlin is on the 1977 Blue List of the National Audubon Society with concurrence of 89 percent of the respondents (Arbib 1977).

Potential Impacts of Mining: Mining and reclamation activities in the interior are likely to have little effect on Merlin populations. Estuaries with their large concentrations of sandpipers and plovers are important foraging localities for migrants and winterers. Altering these natural habitats through activities associated with mining, either directly or indirectly, probably would further stress a declining species.

Selected References:

*Arbib, R. 1977. The Blue List for 1977. Am. Birds 30(6):1031-1039.

*Robbins, C. S., B. Bruun, and H. S. Zim. 1966. Birds of North America. Golden Press, New York. 340 pp.

*Wiley, J. W. 1976. Merlin, Pages 939-943 *in* Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

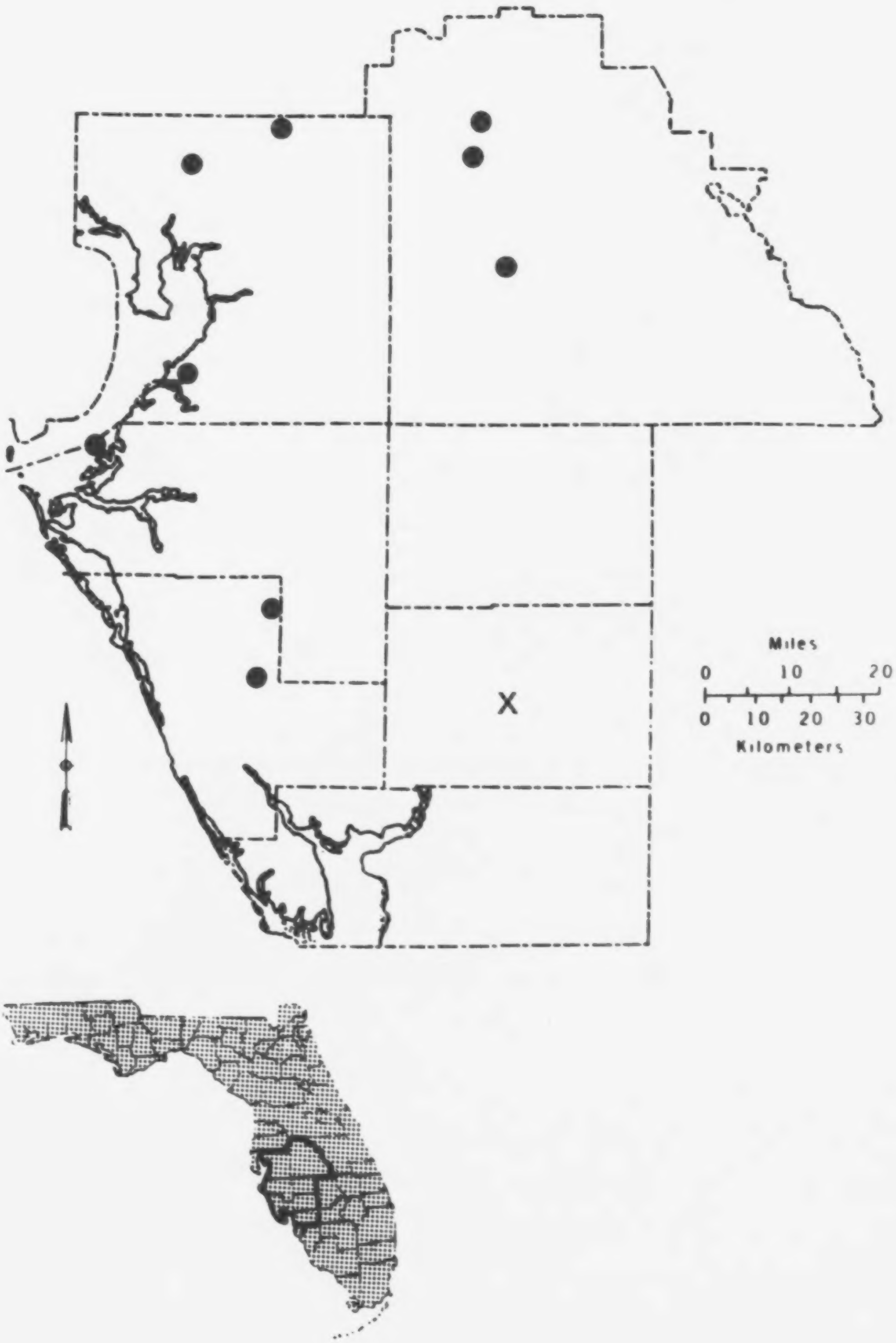
Miles
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Fig. VIII.D.86. MERLIN (*Falco columbarius*)

Listed - Blue List

AMERICAN KESTREL *Falco sparverius* Linnaeus

Listed - Threatened

SOUTHEASTERN AMERICAN KESTREL *Falco sparverius paulus* (Howe and King)

Order Falconiformes Family Falconidae

Other Names: American Sparrow Hawk, Sparrow Hawk, Killy Hawk (*Falco sparverius*); Southeastern Sparrow Hawk, Southeastern Kestrel, Little Sparrow Hawk, Little Kestrel (*F. s. paulus*)

Status of Species in Seven-county Area: Two subspecies of *Falco sparverius* occur within the seven-county area: the Eastern American Kestrel, *F. s. sparverius*, and the Southeastern American Kestrel, *F. s. paulus*. The former subspecies breeds farther north and migrates to the area in winter, while *paulus* is a permanent resident. The two subspecies cannot be reliably distinguished in the field, hence numerous sight records from the area during the time of year when the northern birds are present cannot be identified to subspecies. Among museum specimen records of this species compiled for the study were a number of specimens collected in winter and listed as *paulus*. Such records should be considered questionable without careful examination of the actual specimen.

Distribution: The American Kestrel is found throughout the seven-county area at all times of the year (Tables VIII.D.7, 8). As noted above, it is difficult to determine the details of distribution of the two races, particularly in winter, because of the difficulty of field identification and questionable determinations of museum specimens. Based on dramatic changes in the population, northern birds arrive in the area during late September and October and depart by April or early May. Thus, sight records for the period September-May could represent either subspecies, whereas those between June and August are almost certainly referable to paulus. On the basis of this assumption, both races occur in each of the seven counties. Howell (1932) cited actual specimens of paulus from two localities, Manatee and Miakka Lake, within the seven-county area. Based on summer records, paulus is primarily found in the central portion of the seven-county area, whereas sparverius is more generally distributed throughout the region. Up to 1974, the only banding recovery of a northern bird in the seven-county area was of an individual banded in New Jersey in October 1969 and recovered in Hillsborough County in January 1970 (data on file in Bird Banding Office, U. S. Fish and Wildlife Service). The breeding range of F. s. sparverius extends from Alaska and Canada southward to Baja California, northern Mexico, southern Texas, Arkansas, northern Alabama and northern Georgia, and it winters from southern British Columbia and Nevada eastward through Iowa and Illinois to southern Maine and southward to the Gulf coast, Bahamas, and eastern Panama (AOU 1957). American Kestrels banded in Florida in winter have been recovered in North Carolina, Pennsylvania, New York, Massachusetts, New Hampshire, Maine, and Quebec (J. N. Layne unpubl. data). The range of the Southeastern American Kestrel extends from Louisiana, Mississippi, southern Alabama, and southern Georgia, through all of Florida except the Lower Keys (Friedmann 1950).

Habitat: The American Kestrel occurs in a wide range of habitat types within the seven-county area, most of which are characterized by openness. In winter, kestrels are particularly common along grassy road shoulders in a variety of habitats and in dry prairie, open flatwoods, croplands, and improved pastures. They are also frequent in suburban and urban areas. The species has been regularly observed in unreclaimed phosphate mines and in mined areas restored to grassland. The foregoing comments apply mainly to the northern subspecies, as the specific habitat distribution of paulus in winter is less clear. During the breeding season paulus appears to prefer open forested habitats such as pine flatwoods or oak hammocks with interspersed clearings or more extensive open areas nearby. Availability of suitable nest cavities is apparently a critical habitat factor. Nesting is usually in a dead stub, although they sometimes nest on buildings or other man-made structures. They adapt readily to artificial nest boxes. Studies at the Archbold Biological Station indicate that Southeastern American Kestrels tend to shift activity from more wooded areas during the breeding season to more open areas such as road shoulders and oldfields in winter (J. N. Layne unpubl. data). Thus individuals of the two races may intermix in the same habitats in winter.

Population Status: The Eastern American Kestrel is an abundant winter resident throughout the seven-county area, whereas the subspecies paulus is locally distributed as an uncommon to rare permanent resident. Christmas Bird Counts, which are presumed to represent mainly wintering northern kestrels, range from 2 to 5 individuals per 10 party hours in different regions of the seven-county area (Fig. VIII.D.5). There is no obvious indication of significant regional variation in abundance. The winter counts of the Archbold Biological Station Roadside Censuses in

Charlotte, DeSoto and Hardee counties (Table VIII.D.9) indicate higher numbers in DeSoto County, which reflects a high concentration of birds in the dry prairie - improved pasture areas of the DeSoto Plain. The analysis of Christmas Bird Count data by Bystrak (1974) shows the population to range from 5 to 20 individuals per 10 party hours in the southern portion and from 1 to 5 in the northern part of the seven-county area. The only data on actual winter density in the study area is an estimate of 1 bird per 44.76 ha of pasture in Hillsborough County in January (Dames and Moore 1975).

The Christmas Bird Count time series analysis (Table VIII.D.6) shows a range of relative abundance in the seven-county area of from 3 to 9 individuals per 10 party hours over the period 1966-1976. These data suggest a slight decrease in the winter population after 1971, with perhaps some recovery in 1976. Counts from 1966 to 1971 ranged from 7 to 9 per 10 party hours, fell to 3 to 5 per 10 party hours from 1972 to 1975, and increased to 6 per 10 party hours in 1976. A similar trend is suggested by the Archbold Biological Station Roadside Census winter counts covering a shorter time span (Table VIII.D.10). The lowest count over the period 1974-1977 was in 1974.

The sharp contrast in number of locality records between the September to May and June to August periods is clearly indicative of the low numbers of the subspecies paulus in the seven-county area. This is also dramatically shown in the comparison of the Summer Bird Count and Christmas Bird Count data from the Tampa region (Table VIII.D.11) and the summer and winter counts from the Archbold Biological Station Roadside Census (Table VIII.D.9). Plotted records assumed to represent paulus suggest that the best concentration occurs in the south central part of the seven-county area.

This interpretation is supported by the data from the Breeding Bird Surveys conducted in the area (Table VIII.D.7). No kestrels were recorded in the Hillsborough or northern Polk County surveys from 1971 through 1973, whereas an average of 2 or 3 birds per route was recorded in Manatee, Hardee, and southern Polk counties. In summer censuses involving all or parts of Charlotte DeSoto, Hardee, Hillsborough, and Manatee counties, H. M. Stevenson (1975) recorded the following numbers:

Individuals per hour	Counties
.01	Pinellas, Hillsborough, Manatee
.22	Charlotte, Lee
.19	DeSoto, Hardee
.07+	Polk

Again, there appears to be a tendency toward relatively greater abundance in the southern part of the area.

There are no census data from the seven-county area adequate for analysis of long-term population trends in paulus. However, general observations indicate that its numbers have been declining within the seven-county area as in the state as a whole (Wiley 1976). Evans (1923) stated that many were seen at all times in DeSoto County. Howell (1932) considered it locally common throughout the state, and the account by Bent (1938) indicates this race was common in pinelands of central Florida, including areas in Polk County, in 1925. Van Duyn (1941) and Baynard (1942) listed the kestrel as a common permanent resident in Myakka River State Park. It is presently listed only as a winter resident in this park (Fla. Dept. Nat. Res. 1976). In recent years, it has nearly disappeared from the Lakeland area, the last nesting season record (a single bird) being in June 1976 near Bartow (J. B. Edscorn pers. comm.). G. E. Woolfenden (pers. comm.) recorded breeding in Tampa near Temple Terrace (Hillsborough County) in July 1961 and May 1968 but reported that no kestrels have been seen in summer in the Tampa area since 1971, suggesting that it has probably been extirpated from this region. The fact that no kestrel has been seen on the Tampa Summer Bird Counts (1972-1977) supports this opinion. The race disappeared from southeast Florida by about 1940 and presently is very rare in the southern part of the peninsula (Robertson and Kushlan 1974). The most recent summer records available from the seven-county area are as follows:

County	Locality	Date	Habitat	Source
Sarasota	Old Myakka	5 July 1975	-	Am. Birds 1975 29(5):962
Hardee	Crewsville	6 June 1976	Mixed improved pasture, citrus groves, flatwoods	J. N. Layne (unpubl. data)
Manatee	Myakka Head	30 Aug. 1976	Citrus groves-live oak hammock	J. N. Layne (unpubl. data)
Manatee*	East fork Manatee River	30 Aug. 1976	Improved pasture-open live oak stand	J. N. Layne (unpubl. data)

*Probable family group

Basis for Priority Status: The species is included on the 1977 Blue List of the National Audubon Society, although primary concern is expressed for the Florida and Central Southern Region populations. *F. s. paulus* is listed as Threatened by the Florida Game and Fresh Water Fish Commission and the Florida Committee on Rare and Endangered Plants and Animals on the basis of its serious population decline.

Potential Impacts of Mining: The Eastern Kestrel is generally abundant in winter throughout the area of potential mining. Mining and reclamation activities probably would have little impact on its status in the region. Unreclaimed mined lands in early successional stages and areas reclaimed as grasslands or croplands would probably support populations equivalent to the present natural or non-modified habitats, particularly if suitable perching sites were available. In the case of the resident subspecies, F. s. paulus, however, mining of areas in which it presently occurs is very likely to result in its extirpation. Any reduction of the population of this subspecies in the seven-county area would have a significant effect on the status of its statewide population, as present evidence suggests that the seven-county area, particularly the region of eastern Manatee and western Hardee counties, contains a substantial proportion of the paulus population of southern Florida.

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*Wiley, J. W. 1976. Southeastern American Kestrel, Pages 752-756 in Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

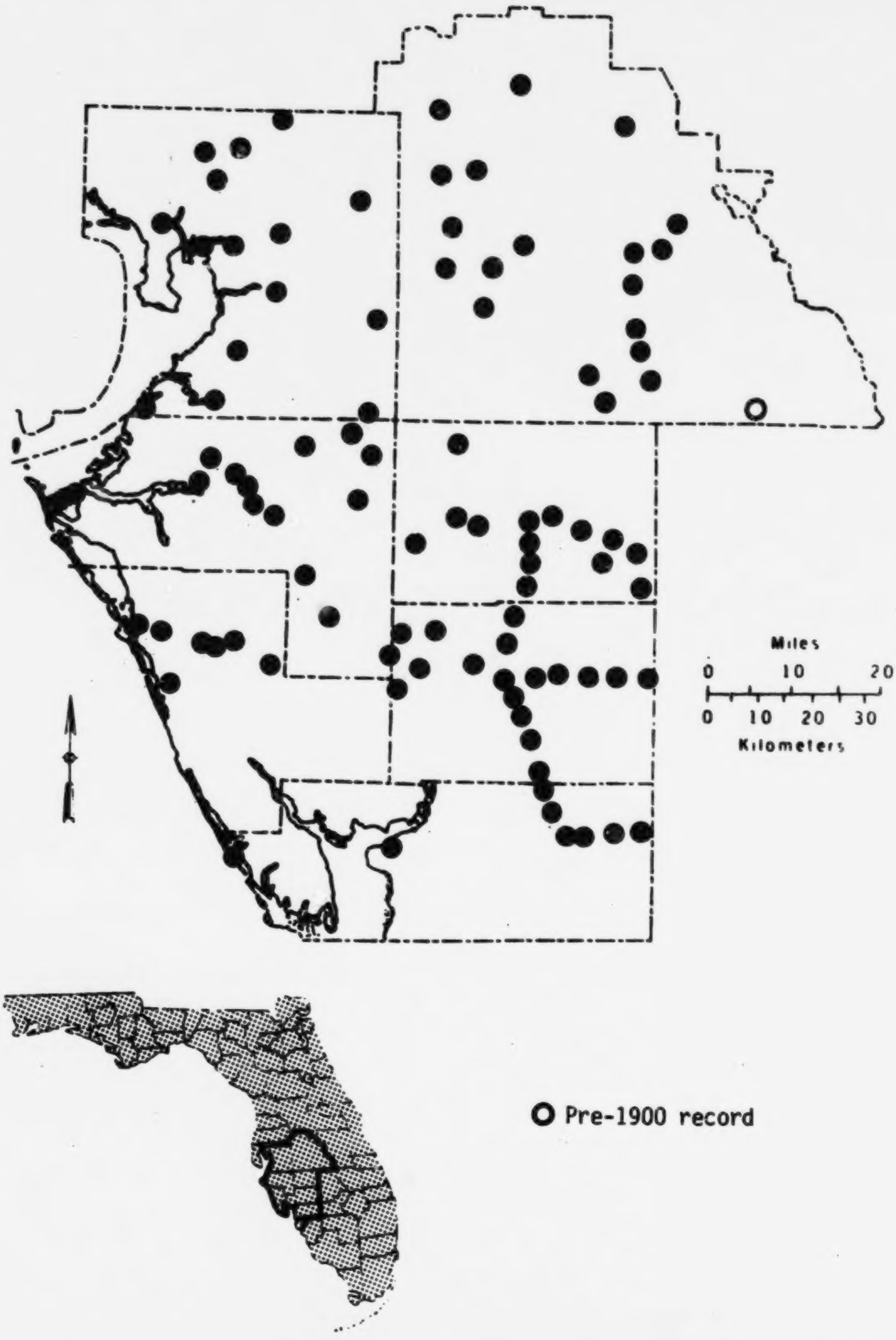
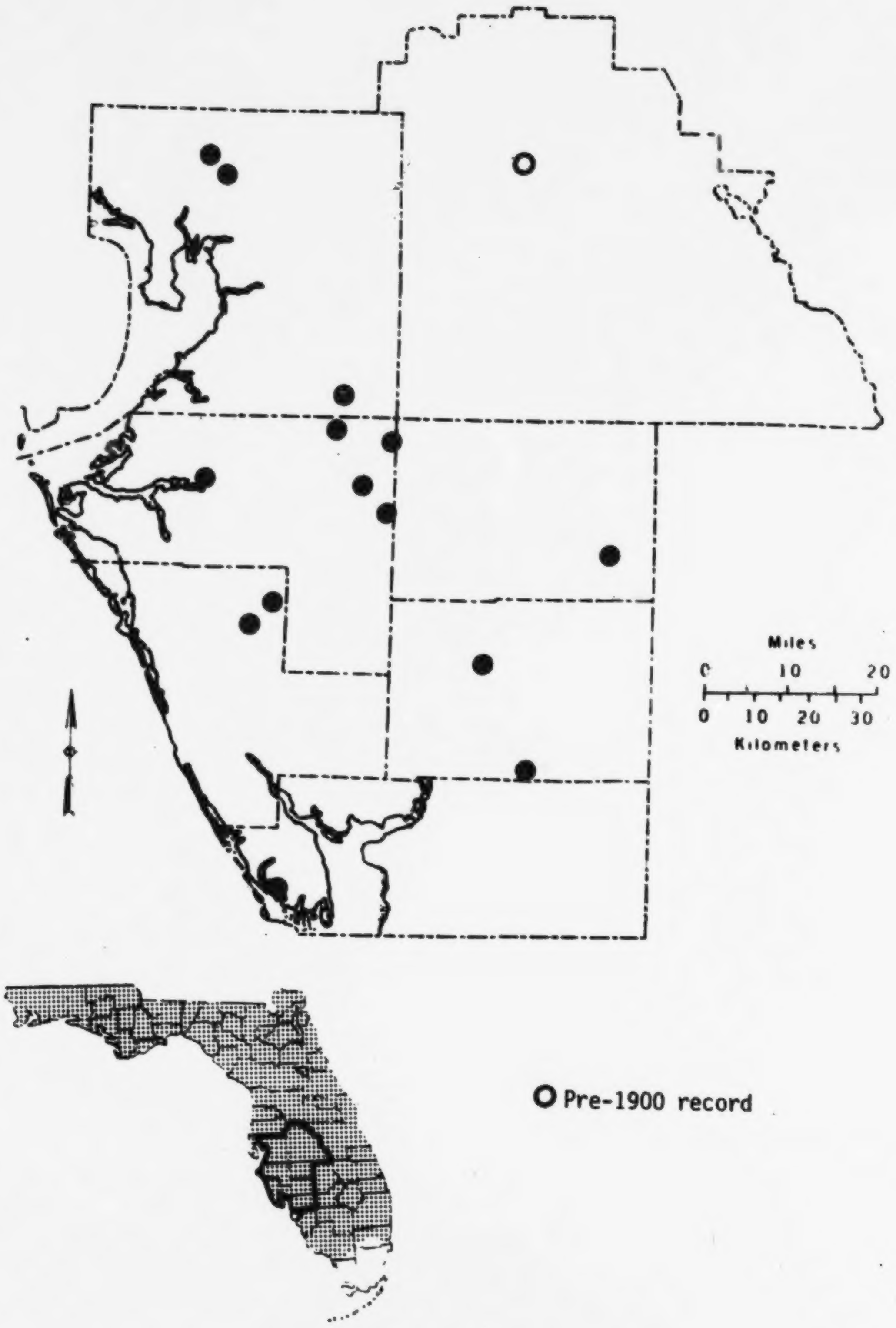

Miles
0 10 20
0 10 20 30
Kilometers
○ Pre-1900 record

Fig. VIII.D.87. AMERICAN KESTREL (*Falco sparverius*). Locality records for the period September-May and undated. Records presumably include both *F. s. sparverius* and *F. s. paulus* but mainly the former.


Miles
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0 10 20 30
Kilometers
○ Pre-1900 record

Fig. VIII.D.88. SOUTHEASTERN AMERICAN KESTREL (_Falco_ _sparverius_ _paulus_). Locality records for the period June-August.

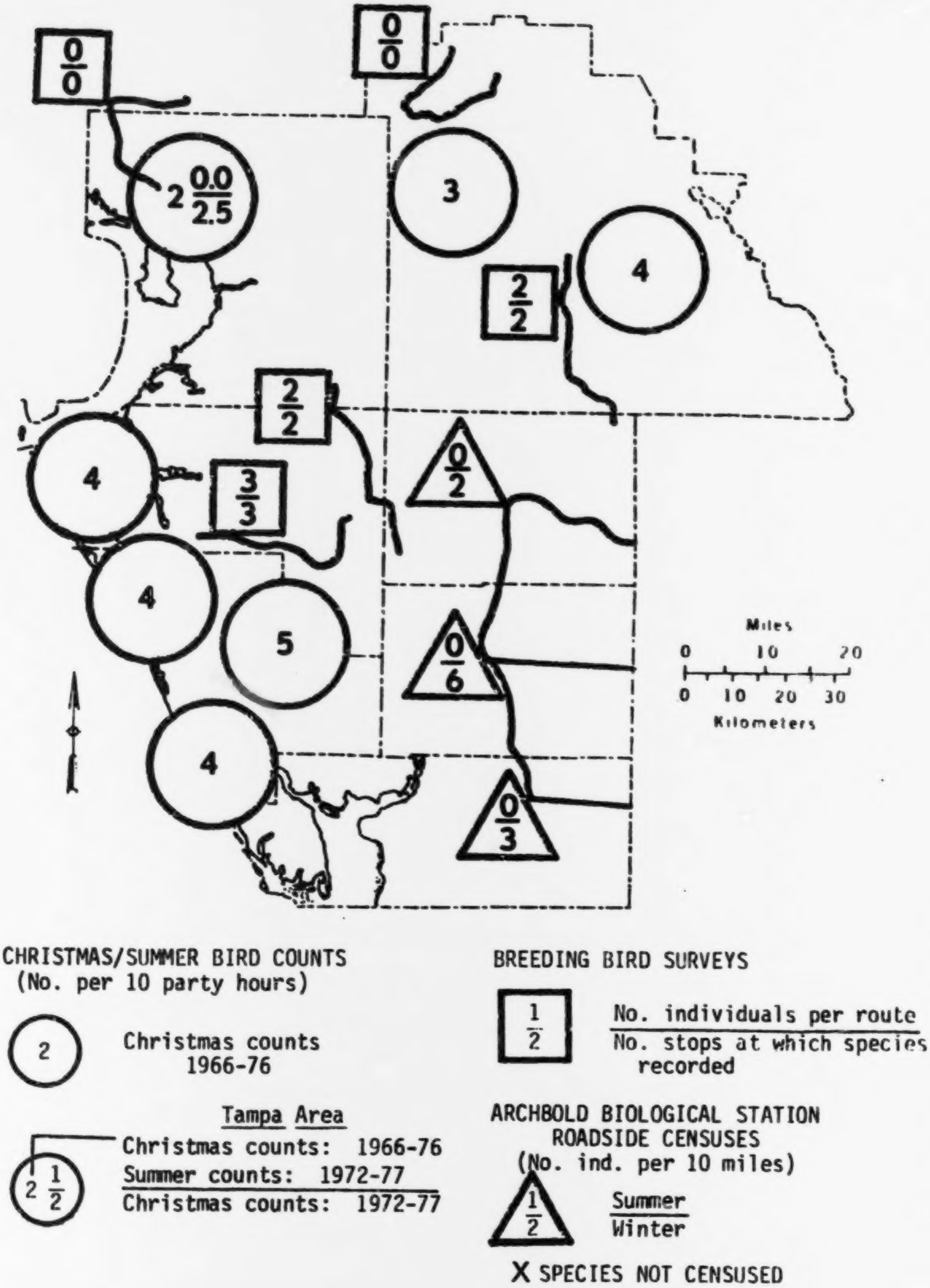
0/0
0/0
2 0.0/2.5
3
2/2
4
2/2
4
3/3
0/2
4
5
0/6
4
0/3
Miles
0 10 20
0 10 20 30
Kilometers
CHRISTMAS/SUMMER BIRD COUNTS
(No. per 10 party hours)
2
Christmas counts 1966-76
Tampa Area
2 1/2
Christmas counts: 1966-76
Summer counts: 1972-77
Christmas counts: 1972-77
BREEDING BIRD SURVEYS
1/2
No. individuals per route
No. stops at which species recorded
ARCHBOLD BIOLOGICAL STATION ROADSIDE CENSUSES
(No. ind. per 10 miles)
1/2
Summer
Winter
X SPECIES NOT CENSUSED

Fig. VIII.D.89. AMERICAN KESTREL (*Falco sparverius*). Population data.

Game

BOBWHITE　　　　　　　　　　　　　　　　_Colinus_ _virginianus_ (Linnaeus)

Order Galliformes　　　　　　　　　　　　　　　　Family Phasianidae

Other _Names_: Quail

Distribution: The Bobwhite is a permanent resident and widely distributed throughout the study area. At least several specific locality records are available for each county. A distinct race, _Colinus_ _virginianus_ _floridanus_, occupies the Florida peninsula north to Alachua County; three other races inhabit eastern and middle North America north to the Great Lakes. An isolated fourth race inhabits southwestern North America, and the species has been introduced successfully in northwestern United States (AOU 1957).

Habitat: Bobwhites live in open pine forests and forest edge with brush. Old fields, and croplands, suburbs and groves with extensive areas of shrubs are acceptable artificial habitats. They are absent from dense forests, wetlands and extensive open pastures.

Population _Status_: The Bobwhite is common throughout the study area. The breeding season calling of the Bobwhite is difficult to overlook and only the visually obvious Cattle Egret and abundant House Sparrow surpass the Bobwhite in numbers recorded on the Breeding Bird Surveys (Table VIII.D.10). Maximum density is about one mature quail per acre. Prior to the 1940's the Bobwhite was abundant in southeastern United States; changes in land use have caused the decline. However the population appears to be stable and at a lower level, which probably more closely approximates historic conditions (Halls and Stransky 1971).

Basis for Priority Status: The Bobwhite is an important game species in Florida. The daily bag limit for the 1976-1977 hunting season was 12. An estimated 2,388,000 Bobwhite are shot annually (Halls and Stransky 1971). The estimated Bobwhite harvest in the South Region, which includes the seven-county area, was 419,304 ± 77,556 in the 1975-76 season (Conklin 1977). The reported density of 2 to 6 Bobwhites per acre (seasonal variation) on the 62,000 acre Charlotte County Wildlife Management Tract (= Cecil Webb Wildlife Management Area) probably is brought on by artificial feeding (Loveless 1958).

Potential Impacts of Mining: Mining operations are not likely to have a significant effect on this widespread, common bird. The species is often abundant on unreclaimed minedlands with mixed grass-forb and shrub cover. With proper management, unrestored and some types of reclaimed mined areas would probably support excellent Bobwhite populations.

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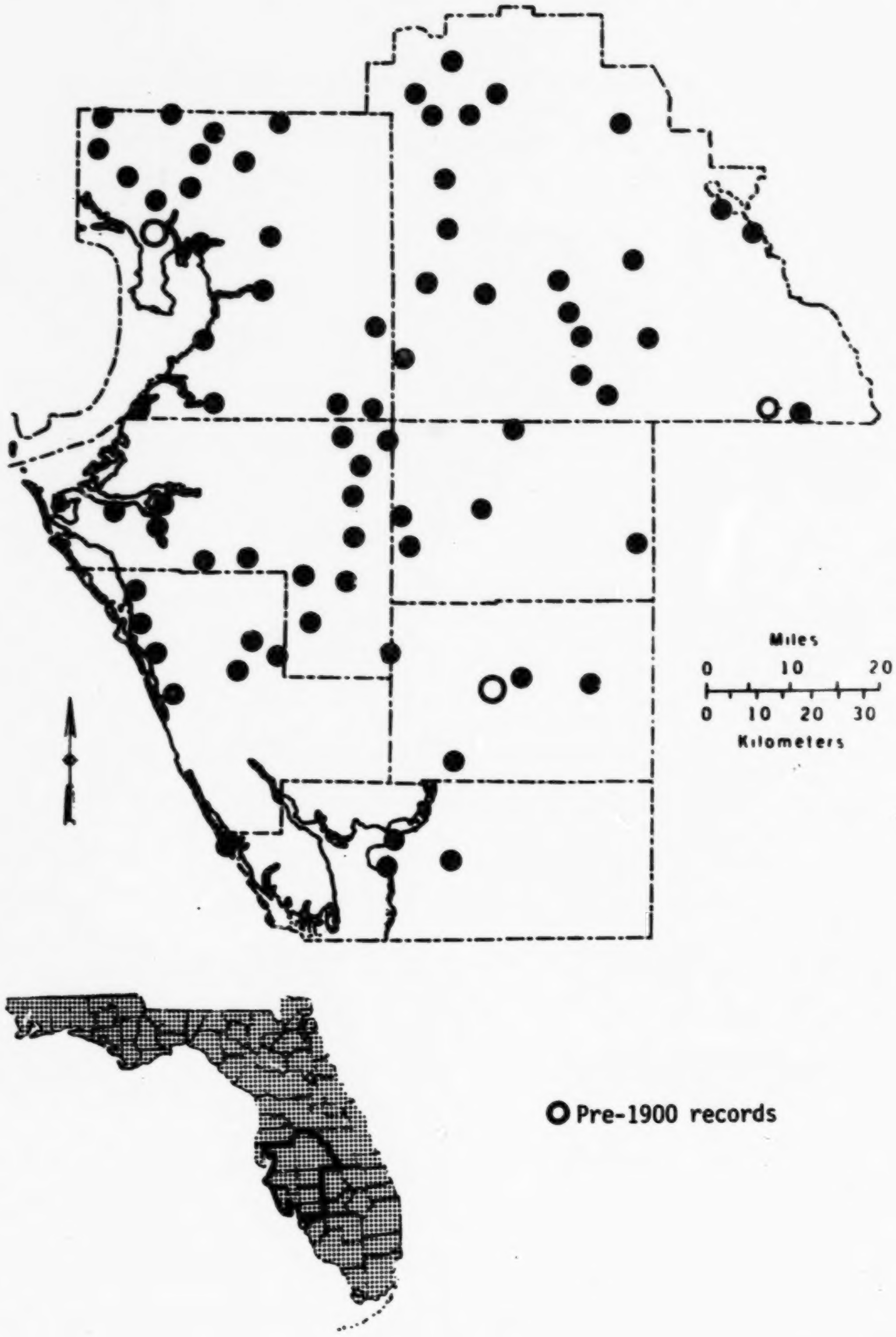
Miles
0 10 20
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Kilometers
○ Pre-1900 records

Fig. VIII.D.90. BOBWHITE (*Colinus virginianus*)

Game

TURKEY — *Meleagris gallopavo* Linnaeus

Order Galliformes — Family Meleagrididae

Distribution: The Turkey ranges throughout the study area, with explicit locality records from Hillsborough, Hardee, Manatee, Polk, and Sarasota counties. The native race in this region was *Meleagris gallopavo osceola*, which formerly ranged throughout peninsular Florida north to near Gainesville. It was a permanent resident wherever it occurred. Other races extended from north central Florida up the Atlantic coast to Pennsylvania and west of the Appalachians patchily across the southern half of the United States (Mosby 1975) and south into Mexico (AOU 1957). Large scale introductions probably have resulted in great mixing of racial characteristics.

Habitat: The Turkey is a bird of the forests and forest edge. It occurs in cypress, pine and hardwoods (Robertson and Kushlan 1974). In the seven counties, and throughout the rest of its range the Turkey has a patchy distribution. It is absent from many seemingly suitable tracts (Robbins *et al*. 1966).

Extensive research has been conducted and published relating to capture, propagation, and a variety of aspects of natural history of the wild Turkey (Hewitt 1967, Sanderson and Schultz 1973 and references listed therein). Important general conclusions from these studies are that eastern wild birds (at least) are difficult to trap and breed in captivity, and that all domestic strains, and certain wild populations, when released at distances from where they are native, do not survive in the wild. These factors provide difficulties for restocking programs and suggest that careful control of hunting limits is an important management tactic.

Population Status: At present the Turkey is a rare and local bird in the seven-county area. Wild Turkey populations reached their lowest numbers in the 1930's. Restoration programs by wildlife agencies succeeded in raising populations to their present numbers (Mosby 1975). The population of wild Turkeys in all of Florida in 1972 was estimated to be 40,000 to 100,000 (Williams 1972). A similar estimate of 75,000 was made for 1961 (Powell 1965), who gave figures for the counties. Between 11 and 23 percent of all Florida Turkeys were thought to inhabit the study area in the following numbers: Charlotte 250-500, DeSoto 2000-5000, Hardee 750-1000, Hillsborough 1000-2000, Manatee 1000-2000, Polk 2000-5000, Sarasota 1000-2000. Halls and Stransky (1971) estimate 1975 Turkeys were killed by hunters in these counties as follows: Charlotte 225, DeSoto 225, Hardee 300, Hillsborough 300, Manatee 200, Polk 575, and Sarasota 150. The total annual harvest in Florida was estimated at 18,500 by Halls and Stransky (1971), 25,000 by Powell (1965), and 17,296 ± 2776 by Conklin (1977) for the 1975-76 season. These estimated harvests are somewhere between about 19 and 63 percent of the entire population. An estimated 4505 ± 1584 Turkeys were killed in the South Region, which includes the seven-county area, in 1975-1976 (Conklin 1977). According to Halls and Stransky (1971) Turkey populations were stable or increasing in 10 of 11 southeastern states; Florida was the exception. This decline was mentioned by Williams (1972), who listed loss of habitat to humans as a possible cause. However, the kill of Turkeys in two wildlife management areas in or near the seven-county area suggest factors other than loss of habitat are involved. At the Avon Park Wildlife Management Area, which lies in Polk and Highlands counties, the kill has decreased from 135 to 42 birds during the past seven years. At the Fisheating Creek Wildlife Management Area in Glades County, the kill decreased almost steadily from 325 in 1964-65 to 26 in 1973-74, increased to 108 in 1974-75, and was zero in 1975-76. In 1977 the total estimated population of Turkeys in the Avon Park area was about 300 and for the Fisheating Creek area about 1000 (D. H. Austin pers. comm.).

Basis for Priority Status: The Turkey is an important and highly regarded game species. Annual harvests in Florida are discussed under Population Status above.

Potential Impacts of Mining: The wild Turkey is well known as a bird of the forests. Further reduction of forest by mining or other human activities in the seven-county area would reduce the population through direct loss of habitat and also, because the species is sedentary, tend to segment the remaining populations into isolates with a high probability of extinction even if protected. It has not yet been demonstrated that potentially suitable habitats for the Turkey can be created in reclaimed areas. Even if this should be possible, it would take a long time for trees to reach suitable size on a particular site.

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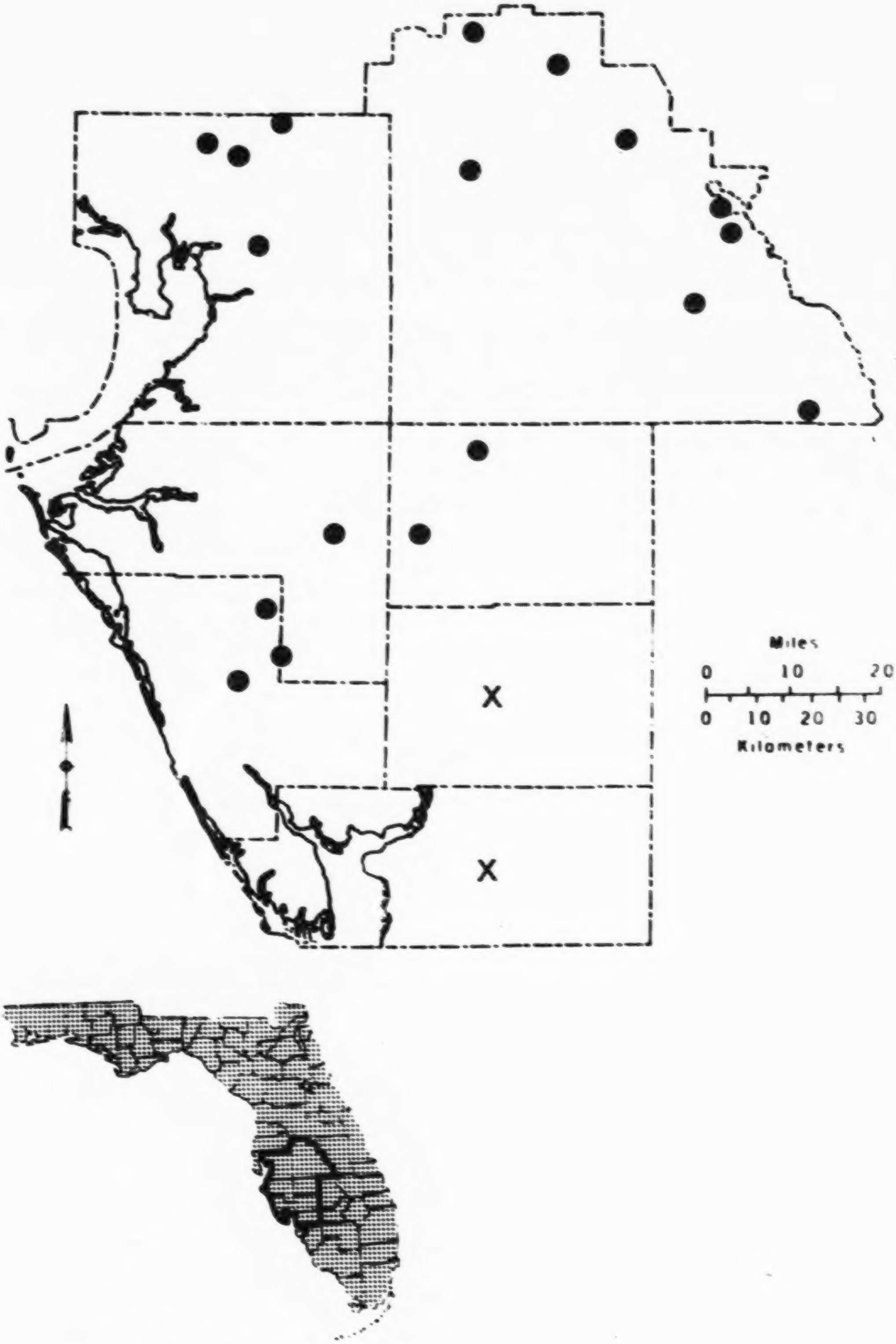
X
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Miles
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Fig. VIII.D.91. TURKEY (Meleagris gallopavo)

Biologically Significant

SANDHILL CRANE *Grus canadensis* (Linnaeus)

Listed - Threatened

FLORIDA SANDHILL CRANE *Grus canadensis pratensis* Meyer

Order Gruiformes Family Gruidae

Other Names: Sandhill Whooper, Whooper, Whooping Crane, Florida Crane (*Grus canadensis pratensis*).

Although this species is often locally referred to in Florida as "Whooper" or "Whooping Crane", it should not be confused with the true Whooping Crane (*Grus americana*) now extirpated from the state and critically endangered in the remainder of its range.

Taxonomic Status of the Population in Seven-county Area: Two subspecies of the Sandhill Crane occur in the seven-county area as well as in other parts of Florida. These are the Greater Sandhill Crane (*Grus canadensis tabida*) and the Florida Sandhill Crane (*Grus canadensis pratensis*). The former is a winter resident and the latter a permanent resident. Since the two subspecies are indistinguishable in the field, subspecific identification during the winter months when both races may be present in the same area is difficult. However, behavioral characteristics offer some clues to subspecific identity. Florida Sandhills usually occur in pairs or in family groups of three or four individuals. In contrast, wintering Greater Sandhills are typically in large, relatively compact flocks. Although Florida Sandhills may form aggregations on occasions, the groups tend to be more loosely organized and dispersed than those of the Greater Sandhill. To further complicate matters, Florida Sandhills are reported to mingle with

Greater Sandhill flocks (Williams 1976).

Distribution: The Sandhill Crane occurs throughout the seven-county area, with actual specimen or sight records available from each county. There are fewer records from the coastal region and Lake Wales Ridge section than other parts of the seven-county area. It is not possible to assign all records of Sandhill Cranes from the area to subspecies because of the problem of field identification. However, it seems safe to assume that pairs or groups of cranes smaller than five individuals or flocks in summer or early fall represent the Florida race, G. c. pratensis. On this basis, it is concluded that pratensis is the prevalent subspecies in the seven-county area, occurring in all counties throughout the year. Actual breeding records are also available for each of the seven counties. The distribution of the Greater Sandhill (G. c. tabida) in the region in winter is less clear. Although winter flocks are likely to be tabida, pratensis may also congregate under certain conditions, as noted above. Thus, records of flocks in winter cannot automatically be assumed to be Greater Sandhills, especially if descriptive details of the nature of the flock are not given. On the basis of season, number of individuals, and other details, flocks most likely to be tabida have been recorded in Charlotte, Hillsborough, Polk, and Sarasota counties. The relatively few records attributable to tabida indicate that this race does not occur generally throughout the seven-county area in winter. Melvin (1977) recorded 14 concentrations of Greater Sandhills in Florida and southeastern Georgia in winter 1976-1977, none of which occurred in the seven-county area. In contrast to Florida Sandhill Cranes, which are essentially sedentary (Williams and Phillips 1972), Greater Sandhills tend to shift their wintering grounds, probably in response to feeding conditions

(Williams and Phillips 1972).

The overall range of the Florida Sandhill extends from the Okefenokee Swamp in extreme southeastern Georgia southward through the Florida peninsula to Dade and Monroe counties, although it is scarce in the latter area. It occurs sparingly in north Florida west of Alachua County and has not been recorded in recent years west of the Apalachicola River, occurring in that vicinity only in small numbers (Williams 1976). The Greater Sandhill winters throughout most of peninsular Florida in the same areas as the Florida subspecies but apparently does not go as far south, at least in significant numbers, as the Everglades (Sanderson 1977). The survey by Melvin (1977) in the winter of 1976-1977 recorded concentrations of this subspecies in the Okefenokee Swamp and southward through Florida to Highlands County, just north of Lake Okeechobee. All of Melvin's localities are grouped along the central axis of the peninsula.

Four populations of the Greater Sandhill Crane are recognized. The birds wintering in Florida belong to the eastern population which nests in Minnesota, Michigan, and Wisconsin and perhaps central Manitoba and western Ontario; migrates through Illinois, Indiana, Ohio, Tennessee, Kentucky, and Georgia; and winters in Alabama, southeastern Georgia, and Florida (Sanderson 1977). Greater Sandhills begin arriving in north Florida in late October and begin to migrate north in late February or early March (Williams and Phillips 1972). The earliest appearance of flocks presumed to be Greater Sandhills farther south in the peninsula (Highlands County), at the same latitude as the seven-county area, has been the second week of November, and the latest dates in spring have ranged from the last week in February to 8 March (J. N. Layne unpubl. data). Bowman and Whitman (1972) and Nesbitt

(1975) suggest that Greater Sandhill Crane spring migration may start simultaneously over a wide area in Florida.

Habitat: The Florida Sandhill Crane prefers open habitats and is found primarily in wet and dry prairies, improved cattle pastures, and shallow marshes or lakes with sparse emergent vegetation surrounded by grasslands (Williams 1976). It may also occur in open flatwoods with low herbaceous ground cover and scattered wet areas and recently-ploughed or planted crop lands. It avoids densely forested areas, brackish and salt marshes, and marshes with dense, tall emergent vegetation such as cattails or sawgrass (Sanderson 1977). Within the seven-county area, Florida Sandhills are usually observed in prairie or improved cattle pasture habitats. A critical habitat factor is the availability of proper nesting sites, typically shallow waters of lakes, ponds, or marshes containing stands of pickerel weed (Pontederia cordata), maidencane (Panicum hemitomon) and arrowleaf (Sagittaria spp.) (Williams 1976). Breeding and nesting success are strongly tied to water levels. Rarely, nests are built in drier situations (Sprunt 1963), and this tendency may be becoming more prevalent in the population as the result of continuing drainage of wetland habitats. At certain times of the year shallow ponds or marshes may serve as communal roost sites (Walkinshaw 1949).

Greater Sandhills wintering in Florida are also usually found in extensive, open habitats. They are often attracted to recently-tilled land. In the seven-county area, flocks are usually in prairies or improved pastures. Melvin (1977) found wintering concentrations of Greater Sandhills in Florida in extensive improved pasture areas and various types of agricultural land, including fields of green oats and rye and fallow fields.

Population Status: The Florida Sandhill is generally uncommon in the seven-county area as a whole but locally common in areas of suitable habitat, particularly in the extensive native prairie and improved pasturelands in Charlotte, DeSoto, Hardee, Manatee, and Sarasota counties and the Kissimmee Prairie area of Polk County. In Christmas Bird Counts in the seven-county area, the mean for the period 1966-1976 has been 1 or less cranes per 10 party hours in the Tampa, Bradenton, Lakeland, and Lake Wales regions as compared with 6 per 10 party hours in the Myakka River State Park and Sarasota localities (Table VIII.D.5). A similar geographic trend is shown by the Breeding Bird Survey data (Table VIII.D.7), with no cranes tallied on the Hillsborough and Polk County routes in contrast to averages of 23 and 24 per route in Manatee and Hardee counties. In the Archbold Biological Station Roadside Censuses (Table VIII.D.9), the highest counts (4 per 10 miles) have been recorded in DeSoto County, with most of the birds in this portion of the route seen in the prairie-pasture area east of Arcadia.

The statewide population of the Florida Sandhill Crane is presently estimated at approximately 4000 to 6000 (Sanderson 1977). About 25 percent are believed to be non-breeders (Williams 1976). There is no estimate available for the population of the seven-county area. Based upon available habitat and numbers of sightings, 400 to 600, or about 10 percent of the total population, would seem to be a reasonable guess. Density of crane populations studied by Walkinshaw (1976) on ranches in Polk and DeSoto counties ranged from one pair per 456 hectares to one pair per 3297 hectares, with a mean of one pair per 1593 hectares. Important refuges for the species within the seven-county area are Lake Kissimmee State Park in Polk County and the Avon Park Bombing Range in Polk and Highlands counties (Walkinshaw

(1976).

Since this subspecies is sedentary, there is no overall seasonal change in abundance, although shifts in habitat utilization may result in apparent local seasonal variation in numbers. For example, of a total of 122 cranes recorded in Hardee, DeSoto, and Charlotte counties in the Archbold Biological Station Roadside Censuses from 1974 through 1977, 103 (84 percent) were counted in winter. This may reflect a tendency to concentrate in improved pastures (which tend to border roads) in winter where feeding conditions might be better and to be more dispersed in summer because of stronger territoriality associated with nesting and the early young-rearing period and perhaps more general food abundance resulting from wetter conditions. In the combined Christmas Bird Count data for the years 1966-1976 (Table VIII.D.6), the average counts range from 1 to 4 cranes per 10 party hours, with no indication of any trend during this period. The Florida Sandhill Crane apparently declined in numbers during the late 1800's and early 1900's. The population was estimated at about 2650 in 1949 (Walkinshaw 1949) and has substantially increased since then. The trend in the recent past is uncertain, but is believed to be slowly downward (Williams 1976).

The number of Greater Sandhill Cranes wintering in the seven-county area in any one year is unknown, but probably does not exceed several hundred individuals. Melvin (1977) located about 4500 birds in the state as a whole in winter 1976-1977 but believed that some concentrations had been missed. The most recent estimate of the total eastern population of this subspecies is 12,000-15,000 (Melvin 1977). Assuming that the bulk of this population winters in Florida, present knowledge of the locations and numbers of flocks is very incomplete.

Basis for Priority Status: The Greater Sandhill Crane is listed as biologically significant because of its general restriction to open habitat types and the fact that such habitats in Florida are critical to the eastern population of the race, which is believed to winter largely in Florida. The Florida Sandhill Crane is listed as Threatened by the Florida Game and Fresh Water Fish Commission and the Florida Committee on Rare and Endangered Plants and Animals because of the lack of accurate population data and definite knowledge of the current population trend and the potential detrimental effect on its status of continuing drainage and destruction of its habitats. Miller *et al*. (1972) contended that Sandhill Crane populations are not being monitered accurately enough to detect a major decline if it did occur.

Potential Impacts of Mining: Given the relative scarcity of Greater Sandhill Cranes in the seven-county area, mining activities would probably not have a significant effect on the status of this race in the region. Since winter flocks in the area do not seem to be highly site specific from year to year, flocks displaced by mining in one site could probably locate other suitable wintering grounds. However, extensive elimination of prairie and open pasturelands in the region would reduce the overall carrying capacity for cranes and thus the potential of the area to support more cranes in the future. Since Florida is the principal wintering area of the eastern population and land-use practices detrimental to cranes are occurring in other parts of the state, loss of potential habitat in the seven-county area could have significant implications for the future status of the wintering Greater Sandhills population. Reclamation as currently practiced would probably restore some crane habitat in the form of pastureland.

The potential impact of mining on the Florida Sandhill is more critical both because a greater proportion of the total population would be affected and because the environmental changes produced by mining and reclamation would have a more serious effect on this race. Being basically sedentary year-round and highly territorial during the breeding season, Florida Sandhills displaced by mining would be less likely to successfully shift their ranges to new areas. Greater Sandhills require only suitable foraging areas, while Florida Sandhills also require proper shallow water nesting sites. Destruction of shallow marshes and ponds by actual mining or dewatering of mine sites would thus be an added deleterious impact on the resident cranes. The artificial lakes and ponds with relatively steep sides and considerable depth now produced in reclamation do not provide satisfactory Florida Sandhill nesting habitat, although areas reclaimed to grasslands would probably provide suitable foraging areas. Establishment on reclaimed land of shallow lakes, ponds, and marshes with suitable stands of emergent vegetation in association with open, drier uplands would probably significantly alleviate the long-term impact of mining on the population.

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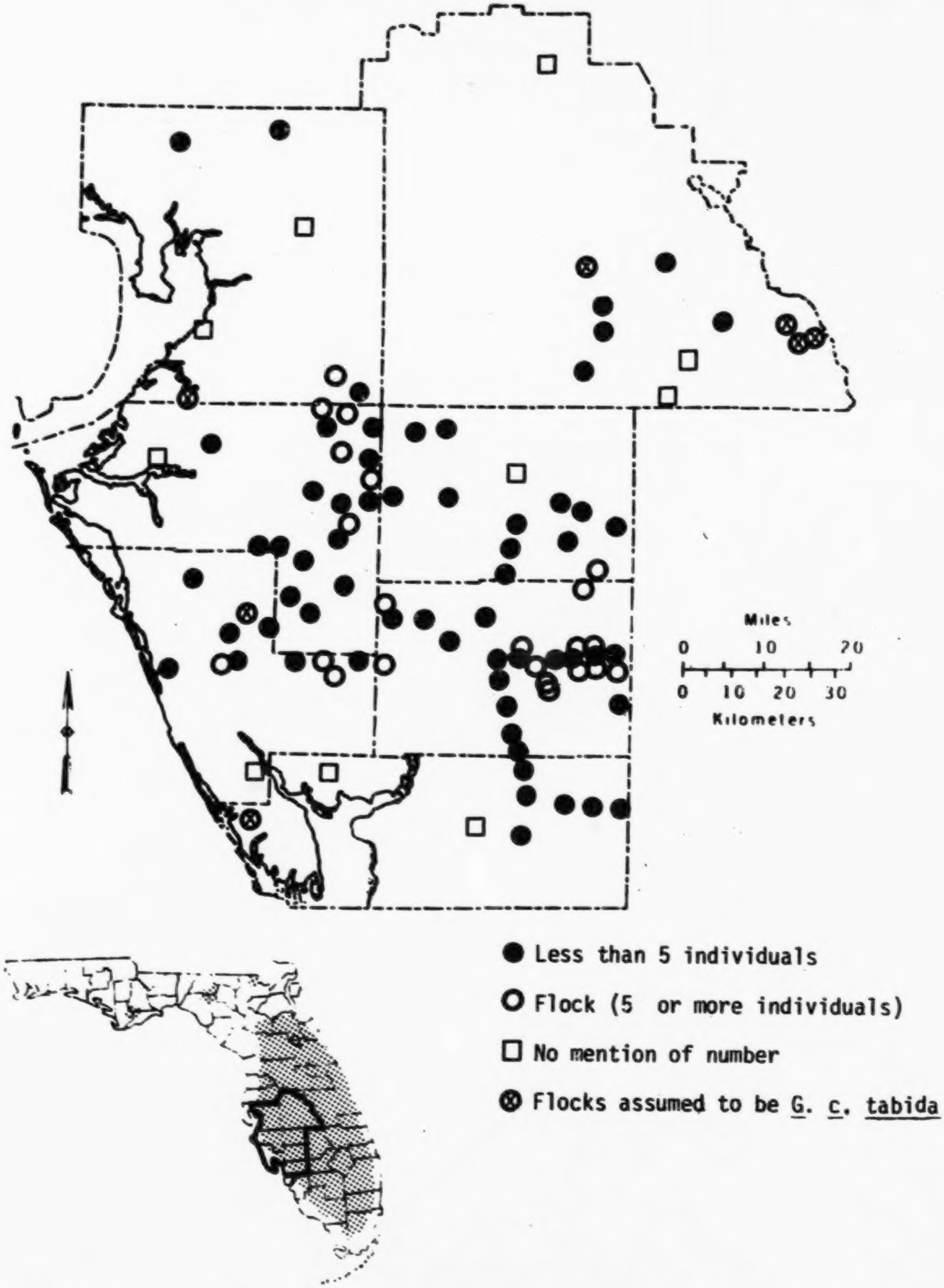
*Williams, L. E., Jr. 1976. Sandhill Crane, Pages 764-768 _in_ Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

*Williams, L. E., and R. W. Phillips. 1972. North Florida Sandhill Crane populations. Auk 89:541-548.


Miles
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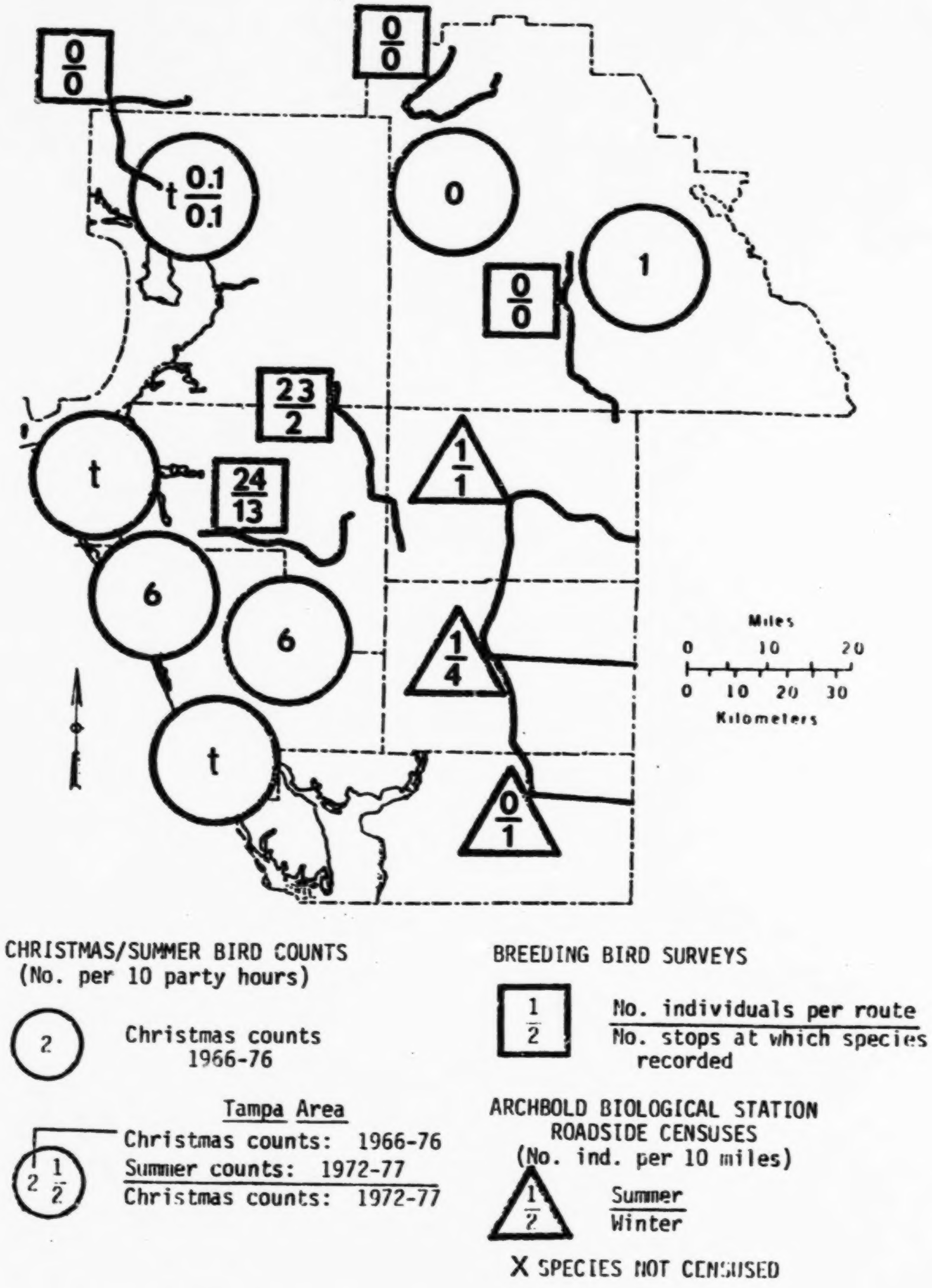
● Less than 5 individuals
○ Flock (5 or more individuals)
☐ No mention of number
⊗ Flocks assumed to be G. c. tabida

Fig. VIII.D.92. SANDHILL CRANE (Grus canadensis)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Miles
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Kilometers
CHRISTMAS/SUMMER BIRD COUNTS
(No. per 10 party hours)
2
Christmas counts
1966-76
Tampa Area
2 1/2
Christmas counts: 1966-76
Summer counts: 1972-77
Christmas counts: 1972-77
BREEDING BIRD SURVEYS
1/2
No. individuals per route
No. stops at which species recorded
ARCHBOLD BIOLOGICAL STATION
ROADSIDE CENSUSES
(No. ind. per 10 miles)
1/2
Summer
Winter
X SPECIES NOT CENSUSED

Fig. VIII.D.93. SANDHILL CRANE (Grus canadensis). Population data.

Biologically Significant

LIMPKIN

Aramus guarauna (Linnaeus)

Order Gruiformes

Family Aramidae

Other Names: Courlan, Crying Bird

Distribution: The Limpkin is recorded from five of the seven counties, with specific locality records available for Hillsborough, Polk, Manatee and Sarasota counties. The species mostly lives in dense habitat and often is shy; no doubt it is more widespread than the records show. In North America the species is nearly restricted to Florida extending farther north regularly only to southeastern Georgia. The species also occurs from southern Mexico southward into South America (Stevenson 1976).

Habitat: Limpkins in North America feed mostly on large freshwater snails and bivalves, and their range corresponds closely to that of the Apple Snail genus *Pomacea* (Harper 1936, Sprunt 1948). They are restricted to habitats where these food items live: stream and river banks, wooded swamps, and some freshwater marshes. They also occur along vegetated man-made canals. South of the United States Limpkins are known to eat land snails and lizards (Barbour 1943, Wetmore 1916). In the study area the species inhabits long-vacated settling ponds (*e.g.* Saddle Creek Park, Lakeland), but is rare in recently made ponds (*e.g.* Orange Park, Lakeland) (J. B. Edscorn pers. comm.).

Population Status: The Limpkin is uncommon and local in the study area and throughout its range in North America. That the species must wander in order to be where its food occurs is evidenced by its irregular occurrence in Myakka River State Park (Fla. Dept. Nat. Res. 1976) and in Everglades National Park south of the study area (Ogden 1971). Nesting occurs in late winter and early spring (Howell 1932).

Basis for Priority Status: The Limpkin is biologically significant because it is an interior wetlands bird with special habitat requirements. Only wooded swamps or extensive marshes, and apparently only those with clear water are inhabited.

Potential Impacts of Mining: Further reduction or degradation of the already limited freshwater wooded swamps and extensive marshes in the seven-county area by mining activity will negatively affect Limpkin populations. Although recent settling ponds apparently are unsuitable habitat, ponds in a later successional stage do provide acceptable habitat for the species. Thus, such habitats resulting from mining would probably compensate to some extent for loss of natural wetlands. The degree to which this would be true would depend upon the number of such areas and the length of time they remain in suitable condition.

Selected References:

*Barbour, T. 1943. Cuban ornithology. Mem. Nuttall Ornithol. Club 9.

*Florida Department of Natural Resources. 1976. Vertebrates of Myakka River State Park. 26 pp.

*Harper, F. 1936. The distribution of the Limpkin and its staple food Pomacea. Nautilus 50:37-50.

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

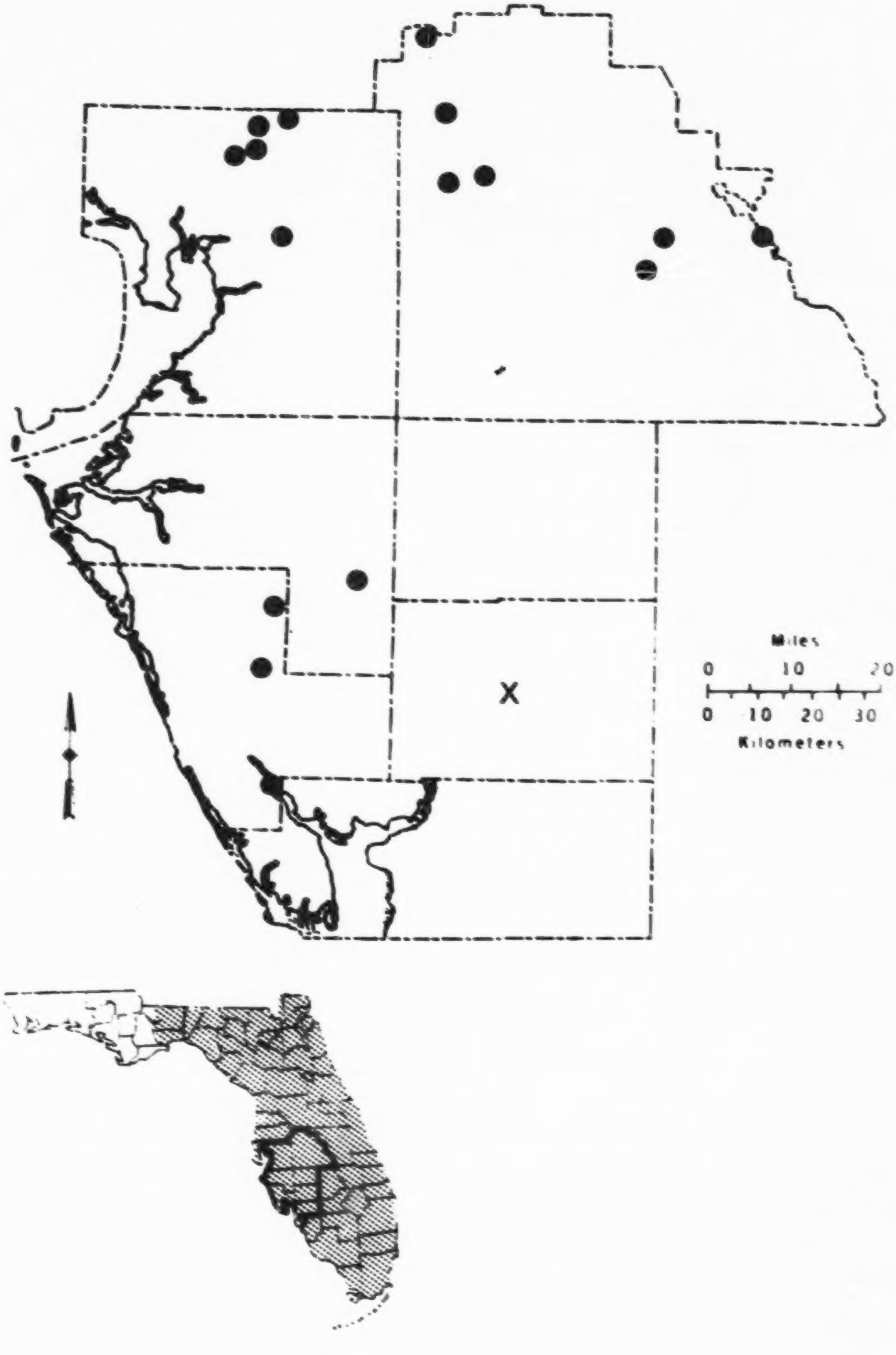
*Ogden, J. C. 1971. Florida region. Am. Birds 25(5):846-851.

Snyder, N. F. R., and H. A. Snyder. 1969. A comparative study of mollusc predation by Limpkins, Everglade Kites, and Boat-tailed Grackles. The Living Bird 8:177-224.

*Sprunt, A., Jr. 1948. Voice in the wilderness. Fauna 10(2):39-42.

*Stevenson, H. M. 1976. Vertebrates of Florida, identification and distribution. Univ. Presses of Fla., Gainesville. 607 pp.

*Wetmore, A. 1916. Birds of Puerto Rico. U. S. Dept. Agr. Bull. 326.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Kilometers
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Fig. VIII.D.94. LIMPKIN (Aramus guarauna)

Listed - Blue List

Game

KING RAIL | Rallus elegans Audubon

Order Gruiformes | Family Rallidae

Other Names: It has been suggested that this species is conspecific with the Clapper Rail, Rallus longirostris (Stevenson 1976).

Distribution: Definite records of the King Rail are available from each of the seven counties except Charlotte. It undoubtedly also occurs in Charlotte County (Stevenson unpubl. MS), but a specific locality is lacking. Some King Rails are permanent residents in the study area. The species breeds throughout eastern United States except in northern New England; it winters on the Coastal Plain and along the lower Mississippi River (Robbins et al. 1966). Thus the widespread Florida summer populations are augmented by winter residents.

Habitat: The King Rail inhabits freshwater marshes. Occasionally, especially during migration, individuals are found in brackish marshes. The preferred freshwater habitats range from extensive stands of cattails to ditches, wet meadows, and flooded stands of willows and other shrubs with some sedges and grasses.

Population Status: The King Rail is uncommon and local in the seven-county area (Fla. Dept. Nat. Res. 1976, Edscorn unpubl. MS). As is typical of most rails, it is secretive and therefore difficult to census.

Basis for Priority Status: The King Rail is included on the 1977 Blue List of the National Audubon Society. Throughout its range it is suffering, along with other marsh wildlife, from the draining of wetlands. The King Rail is a game bird in Florida. Though not distinguished from other members of its genus (MacDonald and Martin 1971), it probably forms a relatively small portion of the kill of rail hunters. Florida is one of the states in which rail (other than Sora) hunting is relatively important (MacDonald and Martin 1971). There are no harvest statistics for the seven-county area; for the state as a whole the minimum average harvest from 1964 to 1969 was about 5200 rails, presumably mostly Clappers, based on statistics given by MacDonald and Martin (1971).

Potential Impacts of Mining: Many recent records of this species come from phosphate settling basins overgrown with cattails and other marsh vegetation. The relative importance of these artificial habitats remains unknown. Drainage of suitable natural wetlands through mining activities will certainly reduce the carrying capacity of the area for the species; the extent to which this would be compensated for by creation of suitable habitat by slime ponds is open to question.

Selected References:

*Edscorn, J. B. Birds of the Lake Region. Unpubl. MS.

*Florida Department of Natural Resources. 1976. Vertebrates of Myakka River State Park. 26 pp.

*MacDonald, D., and E. Martin, compilers. 1971. Trends in harvest of migratory game birds other than waterfowl 1964-65 to 1968-69. Bur. of Sport Fisheries and Wildl. Spec. Sci. Rept. - Wildl. No. 142, Washington, D. C. 29 pp.

*Robbins, C. S., B. Bruun, and H. S. Zim. 1966. Birds of North America. Golden Press, New York. 340 pp.

*Stevenson, H. M. 1976. Vertebrates of Florida, identification and distribution. Univ. Presses of Fla., Gainesville. 607 pp.

*Stevenson, H. M. Bird field survey. Unpubl. MS.

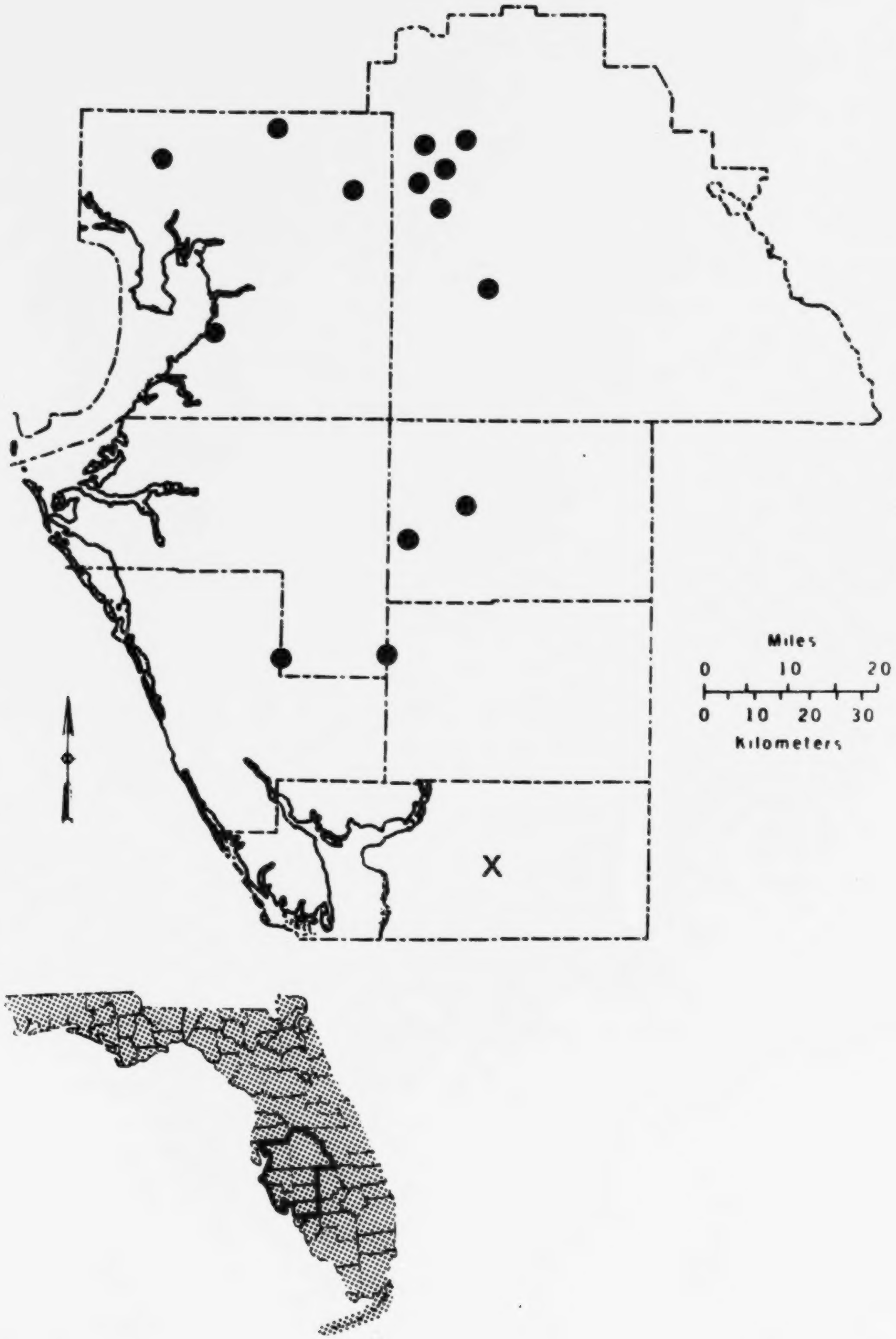
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Fig. VIII.D.95. KING RAIL (Rallus elegans)

Listed - Status Undetermined

Game

FLORIDA CLAPPER RAIL | Rallus longirostris scottii Sennett
Order Gruiformes | Family Rallidae

Distribution: The Florida Clapper Rail is a permanent resident along the Gulf coast of Charlotte, Hillsborough, Manatee, and Sarasota counties. Its total range extends along the Florida coast from Pensacola in the panhandle to Jupiter on the Atlantic coast. A different race inhabits the Florida Keys, and numerous other races inhabit other segments of coastal United States.

Habitat: The Clapper Rail is a tidal marsh bird that lives in black rush (Juncus roemerianus) and cordgrass (Spartina alterniflora) marshes and in mangrove swamps. Relative densities in these two habitats are unknown. The species has a characteristic loud call, and, though secretive, is far less so than other local rails.

Population Status: In the study area, the Florida Clapper Rail occurs only in the narrow band of coastal marshes, which have been fractionated by natural beaches and human development (Kale 1976). Here it is a common permanent resident. Unfortunately, no detailed population studies are available. Considering the tendency of this species to vocalize, call counts would seem to provide a useful index of abundance. McKay Bay, Hillsborough County, has been censused for all birds by parties with the same leader during winter for six consecutive years, 1972-1976. The number of Clapper Rails has varied from 15 to 30; certainly far more inhabit the area (G. E. Woolfenden pers. comm.). The species is encountered in the Tampa area regularly in summer as well as winter (Table VIII.D.11). Two nests have been found at McKay Bay, on 12 April and 17 July 1975. Each had four eggs.

Basis for Priority Status: The Florida Clapper Rail is listed as Status Undetermined by the Florida Committee on Rare and Endangered Plants and Animals. Although it is known that much of its habitat has already been eliminated and the trend is continuing, there has as yet been no serious attempt to determine the present level of its population. Its close association with an endangered habitat is enough to give cause for concern about its status. The Florida Clapper Rail is also a game bird. Among rails other than the Sora it is the main species taken by hunters in Florida, which is an important rail hunting state. There are no data on harvests in the seven-county area and only very incomplete information on numbers of rails killed by hunters in the state as a whole. Based on data given by MacDonald and Martin (1971) on numbers of hunters hunting rails and average season bag per hunter, the calculated average number of rails, presumably mostly this species, taken annually in Florida from 1964 to 1969 is about 5200. The data show a steady increase in estimated annual harvest from 1964-65 (1159) to 1968-69 (7558), with a maximum harvest for the period 1967-68 (8791). The impact of current harvest levels on the Florida Clapper Rail population is apparently unknown.

Potential Impacts of Mining: Only mining activities affecting tidal marshes will have a potential impact on Clapper Rails. Such effects could include altering the quality of the river waters that flow into the estuarine marshes and mangrove swamps with consequent deleterious effects on food chains or other aspects of these ecosystems. In addition, secondary effects of mining, such as construction of new port facilities, harbor dredging, etc. to accomodate increased shipping, that result in salt marsh destruction or deterioration would be detrimental to this species.

Selected References:

*Kale, H. W., II. 1976. Florida Clapper Rail, Pages 944-946 in Inventory of rare and endangered biota of Florida (interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

*MacDonald, D., and E. Martin, compilers. 1971. Trends in harvest of migratory game birds other than waterfowl 1964-65 to 1968-69. Bur. of Sport Fisheries and Wildl. Spec. Sci. Rept. - Wildl. No. 142, Washington, D. C. 29 pp.

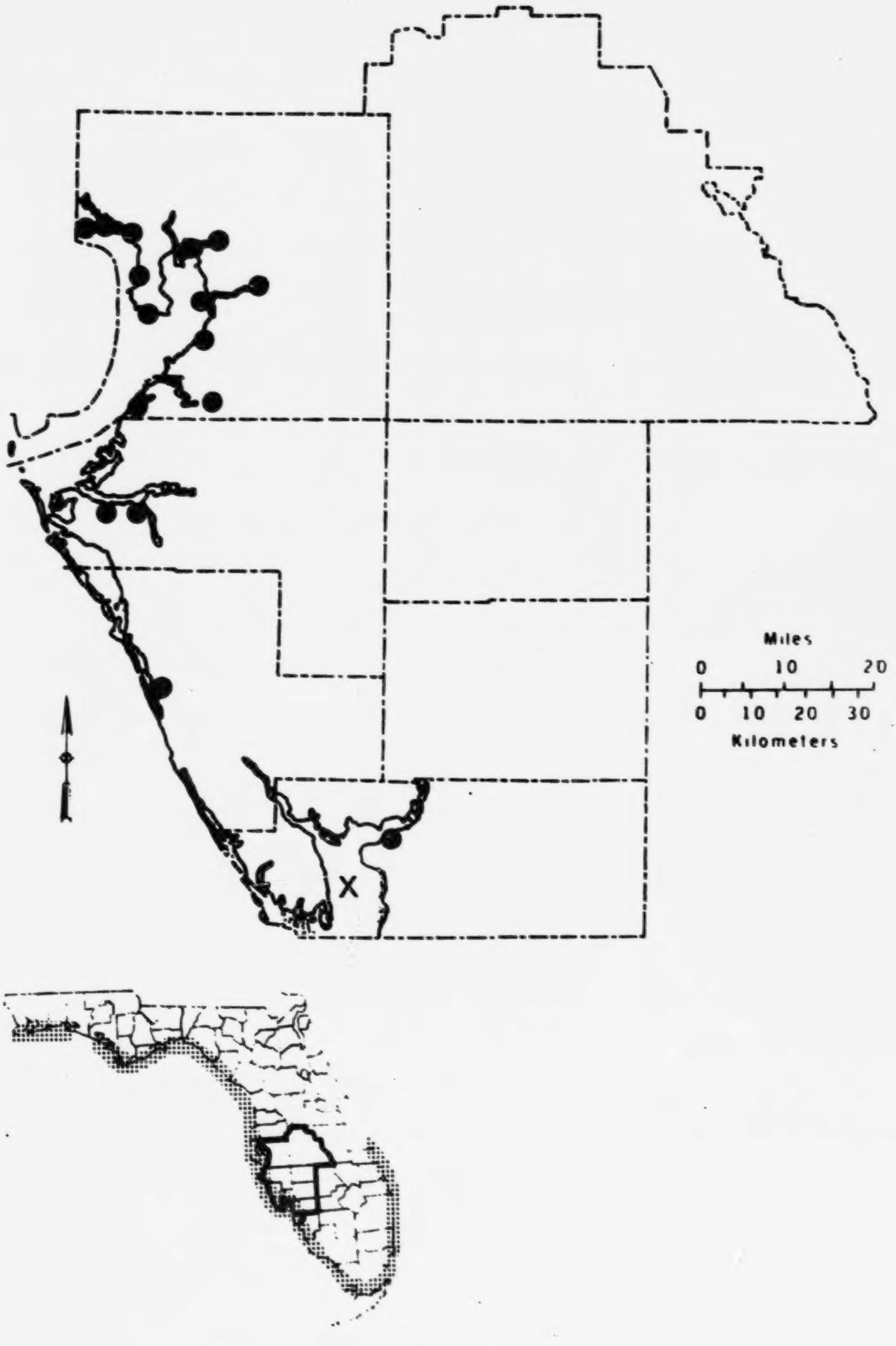
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Fig. VIII.D.96. FLORIDA CLAPPER RAIL (*Rallus longirostris scottii*)

Game

VIRGINIA RAIL | Rallus limicola Vieillot

Order Gruiformes | Family Rallidae

Distribution: The Virginia Rail is recorded from four of the seven counties. Records exist for several localities in Hillsborough and Polk counties and from Myakka River State Park in Manatee and Sarasota counties. No doubt it also occurs in the other three counties and has failed to be recorded there because fewer observers have worked in these areas. A winter resident throughout Florida, the Virginia Rail is a breeder over much of the northern United States and southern Canada. It is found in the study area from October to April (Edscorn unpubl. MS).

Habitat: Virginia Rails inhabit fresh and brackish marshes. Habitat records for the study area are meager, but they suggest absence from salt marshes and perhaps a preference for cattails.

Population Status: The Virginia Rail probably is best regarded as an uncommon winter resident (G. E. Woolfenden pers. comm.), however it may deserve designation as rare (Edscorn unpubl. MS). The bird is secretive and often silent, and no biologist has concentrated on studying the species.

Basis for Priority Status: The narrow restriction of this species to herbaceous-dominated wetlands makes it a valuable indicator of the status of these ecosystems and thus useful for monitoring purposes. The Virginia Rail is a game species. Harvest data for this species in Florida are combined with those of other rails, other than the Sora, in the estimates made by MacDonald and Martin (1971). Because of its rarity, the Virginia Rail harvest in the seven-county area is probably negligible.

Potential Impacts of Mining: Destruction or degradation of freshwater marsh habitats by mining or associated activities would reduce the carrying capacity of the seven-county area for the Virginia Rail. However, evidence suggests that settling basins at a certain state of succession provide suitable habitat,and thus an increase in these artificially created habitats may help balance loss of natural areas as mining proceeds. Provision for shallow, densely vegetated marshes or marshy lake and pond borders in reclamation plans would also favor this species. The suitability of slime ponds and the factors to be considered in creating suitable habitat for this species in reclaimed lands need study.

Selected References:

*Edscorn, J. B. Birds of the Lake Region. Unpubl. MS.

*MacDonald, D., and E. Martin, compilers. 1971. Trends in harvest of migratory game birds other than waterfowl 1964-65 to 1968-69. Bur. of Sport Fisheries and Wildl. Special Scientific Rept. Wildl. No. 142, Washington, D. C. 29 pp.

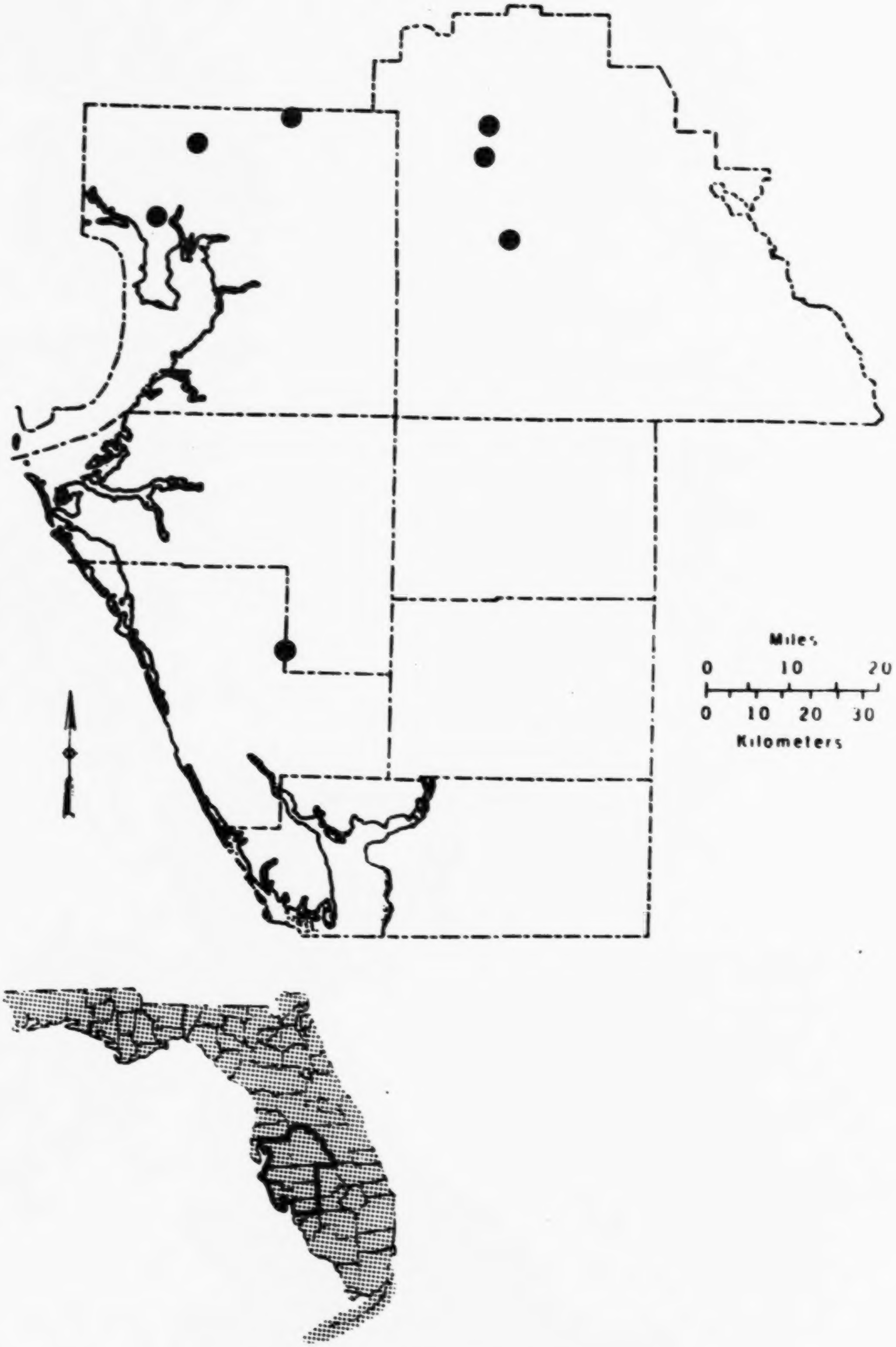
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Fig. VIII.D.97. VIRGINIA RAIL (*Rallus limicola*)

Game

SORA

Porzana carolina (Linnaeus)

Order Gruiformes

Family Rallidae

Distribution: The Sora is recorded from five of the seven counties, Charlotte, Hillsborough, Manatee, Polk, and Sarasota and no doubt occurs in all seven every year. A winter resident and migrant only, the Sora breeds throughout northern United States and much of Canada and winters in the southern coastal states of the United States, Central America, and the West Indies. The species occurs in Florida from August to May (Stevenson 1976).

Habitat: Soras inhabit wetlands of considerable variety, but prefer freshwater marshes and wet meadows. Usually, when found near the coast, the species concentrates in the upper reaches of estuaries. Large concentrations of Soras have been reported from phosphate settling basins with extensive stands of cattails.

Population Status: The Sora is a common winter resident and migrant. The settling basins of Orange Park near Lakeland provide winter habitat for thousands according to J. B. Edscorn (pers. comm.), who lists the species as very common in the Lake Region of Polk County (Edscorn unpubl. MS). It is uncommon in Myakka River State Park (Fla. Dept. Nat. Res. 1976), and rare at Hillsborough River State Park (Stevenson 1967), which has only one small, overgrown marsh. Florida data presented by MacDonald and Martin (1971) show a slight trend toward a decreasing number of Soras killed per hunter from 1964-65 to 1967-68, with a drastic decline in 1968-69.

Basis for Priority Status: With broad tolerance for interior wetlands, including artificial settling basins and a propensity for emitting alarm notes when disturbed, the Sora would be a good indicator organism for the habitats in which it resides. The Sora is a game species. Although data are not available from the seven-county area, considerable numbers are killed in the state as a whole. The data of MacDonald and Martin (1971) give minimum annual harvest estimates of from 1005 to 4259 for the 1964-65 to 1968-69 seasons.

Potential Impacts of Mining: Soras are abundant in winter in settling basin cattail marshes. They also are common in many natural wetland habitats. Thus mining activities that alter natural wetlands but increase artificial wetlands suitable for this species may balance out their effects on its status. However, unless efforts are made for long-term maintenance of slime ponds in a suitable stage for Soras or to provide new wetlands in reclaimed areas to compensate for those lost to mining, the long-term net impact on the species would be negative.

Selected References:

*Edscorn, J. B. Birds of the Lake Region. Unpubl. MS.

*Florida Department of Natural Resources. 1976. Vertebrates of Myakka River State Park. 26 pp.

*MacDonald, D., and E. Martin, compilers. 1971. Trends in harvest of migratory game birds other than waterfowl 1964-65 to 1968-69. Bur. of Sport Fisheries and Wildl. Spec. Sci. Rept. - Wildl. No. 142, Washington, D.C. 29 pp.

*Stevenson, H. M. 1976. Vertebrates of Florida, identification and distribution. Univ. Presses of Fla., Gainesville. 607 pp.

*Stevenson, J. A. 1967. A list of the vertebrates identified in Hillsborough River State Park. Fla. Brd. of Parks. 16 pp.

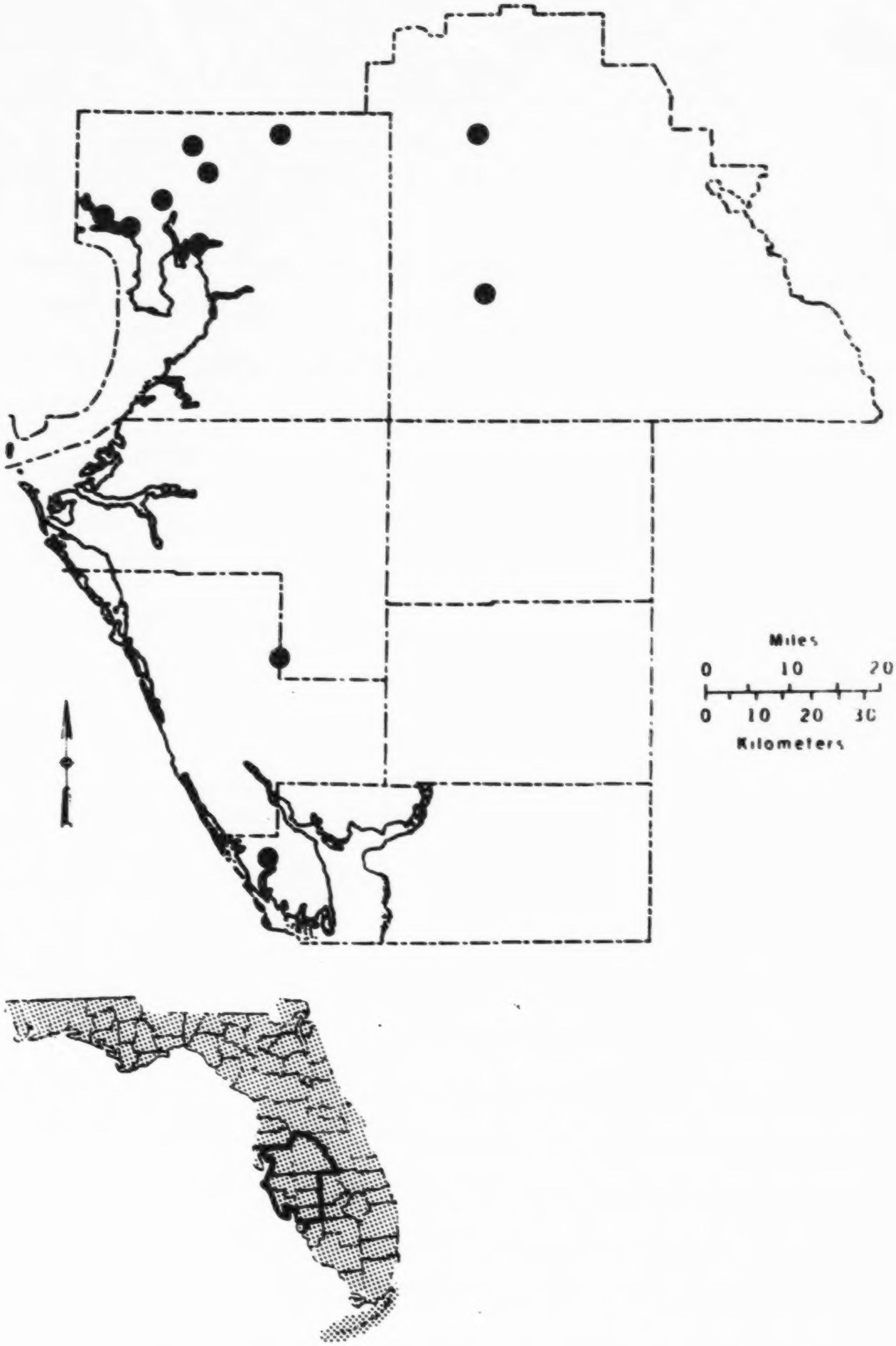
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Fig. VIII.D.98. SORA (Porzana carolina)

Biologically Significant

YELLOW RAIL

Coturnicops noveboracensis (Gmelin)

Order Gruiformes

Family Rallidae

Distribution: The Yellow Rail is known to exist in the seven-county area on the basis of only one reliable record, a specimen collected in November 1951 in Charlotte County (Stevenson 1952). A sight record of one on the Venice-Englewood Christmas Bird Count of 1974 was questioned by the editor.

The Yellow Rail is small, extremely secretive, and rare; therefore little is known of its ecology. The species breeds in north central North America and, in eastern North America, winters near the southeastern coast.

Habitat: The Yellow Rail inhabits fresh and saltwater marshes. Records for all of Florida are few and give no indication of marsh-type preference.

Basis for Priority Status: As a rare wetland species, the Yellow Rail deserves concern for its status. Information regarding its ecology on the wintering grounds in Florida and elsewhere is lacking. Census techniques probably could be developed, with the use of dogs and tape recordings as possibilities. The near total ignorance of the winter habits of the Yellow Rail is a prime example of the basic ecological work that needs to be done on this species.

Potential Impacts of Mining: Because of the lack of knowledge of its actual population status and other aspects of its biology it is impossible to make reasonable predictions on the impacts of mining on its status. Presumably, it would be negatively affected by destruction of areas of potential natural wetland habitats. Certain types of settling ponds might provide suitable habitats but this needs verification.

Selected References:

*Stevenson, H. M. 1952. Yellow Rail collected in Florida. Fla. Nat. 25(2):82-83.

Listed - Status Undetermined

BLACK RAIL | Laterallus jamaicensis (Gmelin)

Order Gruiformes | Family Rallidae

Distribution: The Black Rail is tiny and secretive; it is not known to vocalize away from its breeding grounds or outside of the breeding season. The species probably occurs along the coast in the study area, but the only record is extremely tenuous. Sprunt (1954) reports that Nicholson told him that "on May 23, 1949, he heard, and saw, a Mockingbird imitating 'to perfection' the notes of the Black Rail at Placida on the mainland opposite Boca Grande..." Boca Grande is not opposite Placida but several miles to the south, and furthermore neither is it in Sarasota County as listed parenthetically by Sprunt. Placida is in Charlotte County; Boca Grande is just over the line in Lee County. That Placida is the locality where Mockingbirds were heard to imitate the Black Rail gains credence from Hewitt (1976) who recently witnessed the same event in the Placida - Cape Haze area. Regardless of the inconsistencies in the literature, in all probability Black Rails exist in the study area and probably breed there. Edscorn (unpubl. MS) includes it on the hypothetical list for the Lake Region, Polk County. In July, before migrants would be expected in Florida, Hewitt (1976) counted 15 individuals at the Ding Darling Natural Wildlife Refuge in Lee County only a few miles south of Charlotte County.

Habitat: In Florida the Black Rail inhabits the upper reaches of tidal salt and brackish marshes in stands of salt meadow grass, or salt hay (Distichlis spicata), cordgrass (Spartina bakerii), and glasswort (Salicornia virginica and S. bigelovii). These vegetative zones tend to be in that portion of the marsh that is inundated infrequently. Occasionally the species occurs in freshwater marshes, meadows, and damp fields with dense but low-growing vegetation (Stevenson 1976).

Basis for Priority Status: Data on Black Rail populations in Florida are lacking, and the species is listed as Status Undetermined by the Florida Committee on Rare and Endangered Plants and Animals. Its known habitat has been reduced in the study area and elsewhere. The upper reaches of many tidal marshes have been drained and/or used for pasture.

Potential Impacts of Mining: Coastal activities associated with mining that might have deleterious effects on tidal marshlands would in turn have a potentially negative impact on this species. The status of the species in inland marshes is so little known that there is little point in speculating on mining impacts on the species in the interior of the seven-county area.

Selected References:

*Edscorn, J. B. Birds of the Lake Region. Unpubl. MS.

*Hewitt, O. H. 1976. Fieldbook of birds of the Florida suncoast. Mote Marine Lab., Sarasota, Florida. 150 pp.

*Sprunt, A., Jr. 1954. Florida bird life. Coward-McCann, Inc., New York. 527 pp.

*Stevenson, H. M. 1976. Black Rail, Pages 952-955 in Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

Biologically Significant

PURPLE GALLINULE | Porphyrula martinica (Linnaeus)

Order Gruiformes | Family Rallidae

Distribution: The Purple Gallinule is recorded from six of the seven counties. No locality record for poorly studied Hardee County was located. In North America this species is restricted to southeastern United States. It breeds throughout mainland Florida and north to South Carolina and west to Louisiana and Tennessee. It winters from western Mexico, southern Texas, Louisiana, and Florida southward to Brazil and northern Argentina. Many migrate over the Gulf to wintering areas south of the United States (AOU 1957).

Habitat: The Purple Gallinule is a secretive bird, living along the shores of lakes, ponds and sluggish rivers in aquatic vegetation and especially cattails. The species does not inhabit saltwater marshes, and appears to be rare in artificial settling pond marshes (J. B. Edscorn pers. comm.).

Population Status: The Purple Gallinule is uncommon in the study area, especially from September through March, when many individuals migrate south out of the United States for winter. Purple Gallinules are rarely seen away from their select habitats. However, the species migrates at night and apparently at low altitudes, because dead birds are found regularly beneath telephone and power lines in spring and fall (J. B. Edscorn and G. E. Woolfenden pers. comm.).

Basis for Priority Status: A wetland bird with habitat requirements as yet poorly defined, the Purple Gallinule is another species useful as an indicator of the condition of interior natural wetlands.

Potential Impacts of Mining: Reduction in quantity and quality of interior wetlands of the type utilized by this species would have a negative effect on its status. Artificially created wetland habitats such as settling ponds have not yet been demonstrated to be suitable habitat.

Selected References:

*American Ornithologists' Union. 1957. Check-list of North American birds. The Lord Baltimore Press, Baltimore, Maryland. 691 pp.

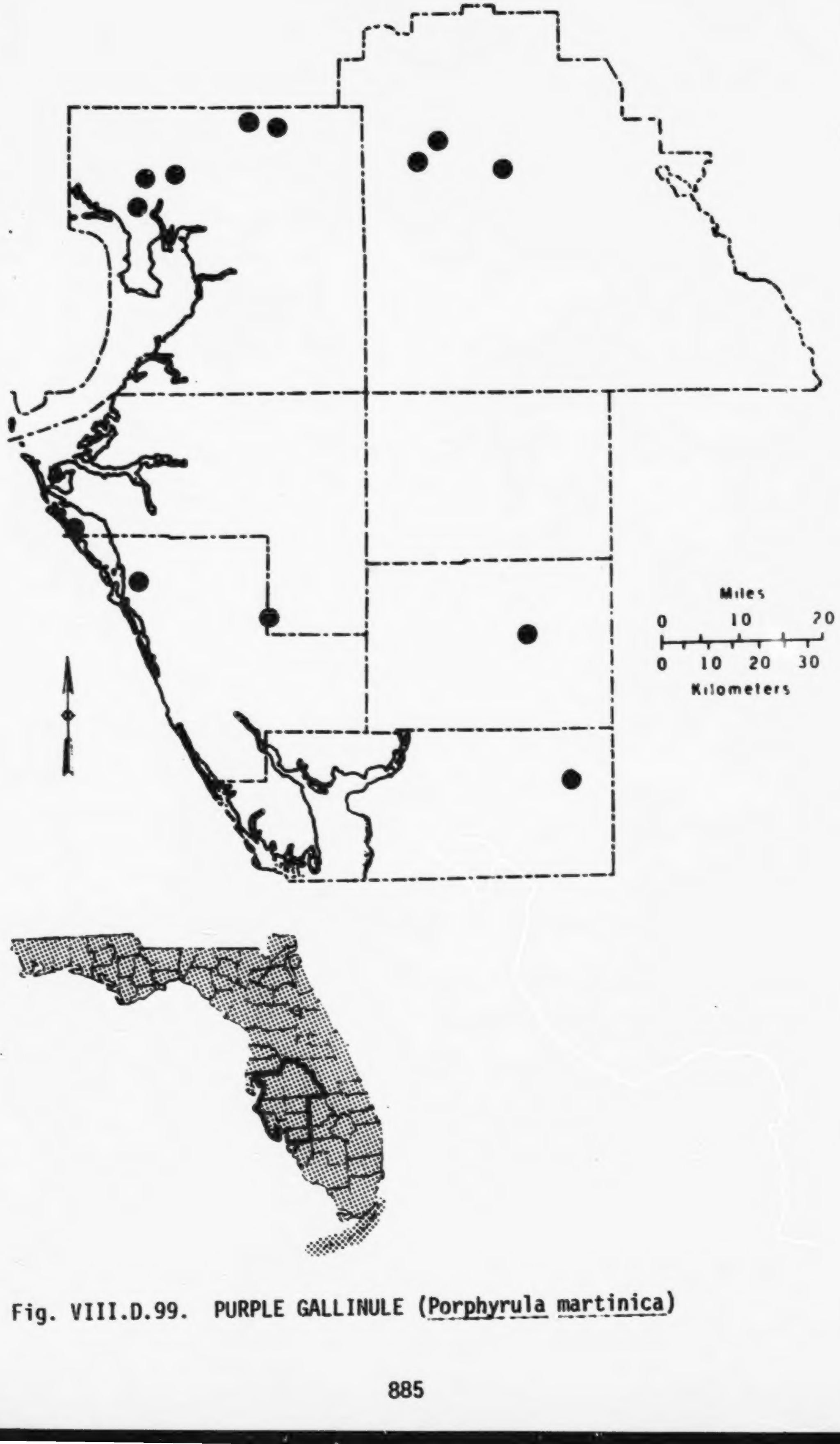
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Fig. VIII.D.99. PURPLE GALLINULE (*Porphyrula martinica*)

Game

COMMON GALLINULE — Gallinula chloropus (Linnaeus)

Order Gruiformes — Family Rallidae

Other Names: Florida Gallinule

Distribution: The Common Gallinule is a widely distributed permanent resident in the seven-county area, although a specific locality record for DeSoto County is lacking. The species breeds throughout Florida and the rest of the eastern United States except northern New England. It winters on the coastal plain.

Habitat: The Common Gallinule lives in freshwater and is found in vegetated areas in almost any quiet or slow moving body of water, including settling ponds. It spends less time in dense vegetation than the true rails and the Purple Gallinule and stays closer to the shoreline growth than the more aquatic Coot. The species avoids lakes devoid of shoreline emergent plants. Forests, dry prairies, and saltwater habitats also are avoided.

Population Status: The Common Gallinule is common throughout the study area in freshwater habitats. The difference in abundance on Tampa Christmas and Summer Bird Counts reflects the influx of individuals from north of Florida that winter in the state (Table VIII.D.11). Annual reproduction could also contribute to the observed winter increase.

Basis for Priority Status: The Common Gallinule is a game species in Florida. During the 1976-77 hunting season the daily bag limit was 15. There is no information on numbers killed in the seven-county area, and such data for the state as a whole are incomplete. Based on the data of MacDonald and Martin (1971), average minimum annual harvests of gallinules in Florida from 1964-65 to 1968-69 have varied from about 2909 to 9202, with a mean of 5103. Average season bag per hunter declined from 9.81 to 5.67 during this period. The reason for this decline is unexplained.

Potential Impacts of Mining: Destruction of interior wetlands by mining would decrease natural habitat of gallinules. Settling ponds are frequented by the species and would provide replacement habitat as long as they remained in the right successional stage. Artificial lakes and ponds created by reclamation would be utilized by the species if shallow areas with emergent vegetation were provided.

Selected References:

*MacDonald, D., and E. Martin, compilers. 1971. Trends in harvest of migratory game birds other than waterfowl 1964-65 to 1968-69. Bur. of Sport Fisheries and Wildl. Spec. Sci. Rept. - Wildl. No. 142, Washington, D. C. 29 pp.

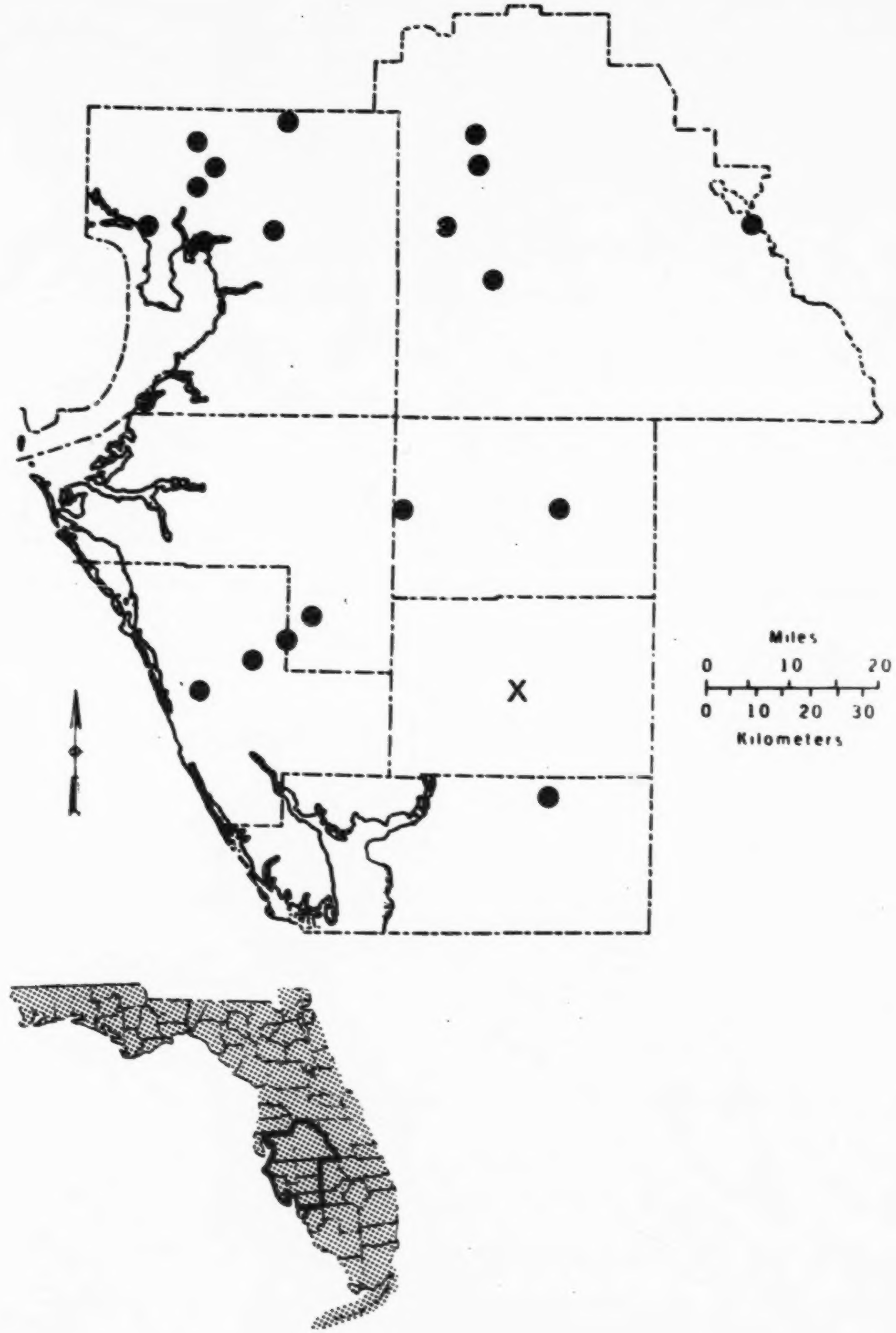
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Fig. VIII.D.100. COMMON GALLINULE (*Gallinula chloropus*)

Game

AMERICAN COOT | *Fulica americana* Gmelin

Order Gruiformes | Family Rallidae

Distribution: The Coot is widely distributed through the seven-county area. It is primarily a winter resident, but a few summer, and still fewer breed. The species occurs as a breeder in the Great Lakes region and, west of the Appalachians, north into the prairie provinces of Canada and winters along coastal United States (Robbins *et al*. 1966).

Habitat: Coots are aquatic rails; they prefer ponds and lakes but also inhabit estuaries and marshes with some open water. A basic requirement is submerged aquatic vegetation.

Population Status: The American Coot is an abundant winter resident, especially in central Florida (Bystrak 1974). It is uncommon in the seven-county area from May to October. Quantitative data on relative abundance in summer and winter for one area, Tampa, are given in Table VIII.D.11. Breeding records based on sightings of downy chicks are available for Hillsborough County (F. E. Lohrer pers. comm., G. E. Woolfenden pers. comm.) and Polk County (J. B. Edscorn pers. comm.).

A preference for fresh water is shown by the number of Coots tallied per 10 party hours on seven Christmas Bird Counts taken in the study area (Table VIII.D.5). Numbers are highest for the Lake Wales Ridge with its numerous lakes, next highest for Lakeland with its many lakes and phosphate mine ponds and impoundments, and third highest for Myakka River State Park, which offers good habitats on lakes and river. The coastal counts, Bradenton, Sarasota, and Venice are by far the lowest of the seven areas.

During the years 1974 to 1976 the Lake Wales Christmas Bird Count recorded from 13,000 to 26,000 Coots during the one day count.

Basis for Priority Status: The American Coot is a game bird in Florida, including the seven-county area. In contrast to true waterfowl (family Anatidae), Coots have no assigned point value. The daily killing limit in the state hunting regulations for 1976-1977 was 15, the possession limit 30. Separate annual harvest figures for this species do not seem to be available.

Potential Impacts of Mining: Actual mining or dewatering natural, shallow aquatic habitats with good stands of emergent vegetation will reduce Coot habitat. On the other hand, phosphate basins such as Orange Park, Polk County, are the wintering grounds for thousands of Coots and other waterfowl. Based on available data, the Coot would probably be favored by mining - at least as long as slime ponds with proper water levels and vegetative cover persisted. However, the ecology of the water birds wintering in slime ponds needs study before definitive conclusions as to the value of slime ponds as waterfowl habitat can be reached.

Selected References:

*Bystrak, D., ed. 1974. Wintering areas of bird species potentially hazardous to aircraft. Nat. Aud. Soc. 156 pp.

*Robbins, C. S., B. Bruun, and H. S. Zim. 1966. Birds of North America. Golden Press, New York. 340 pp.

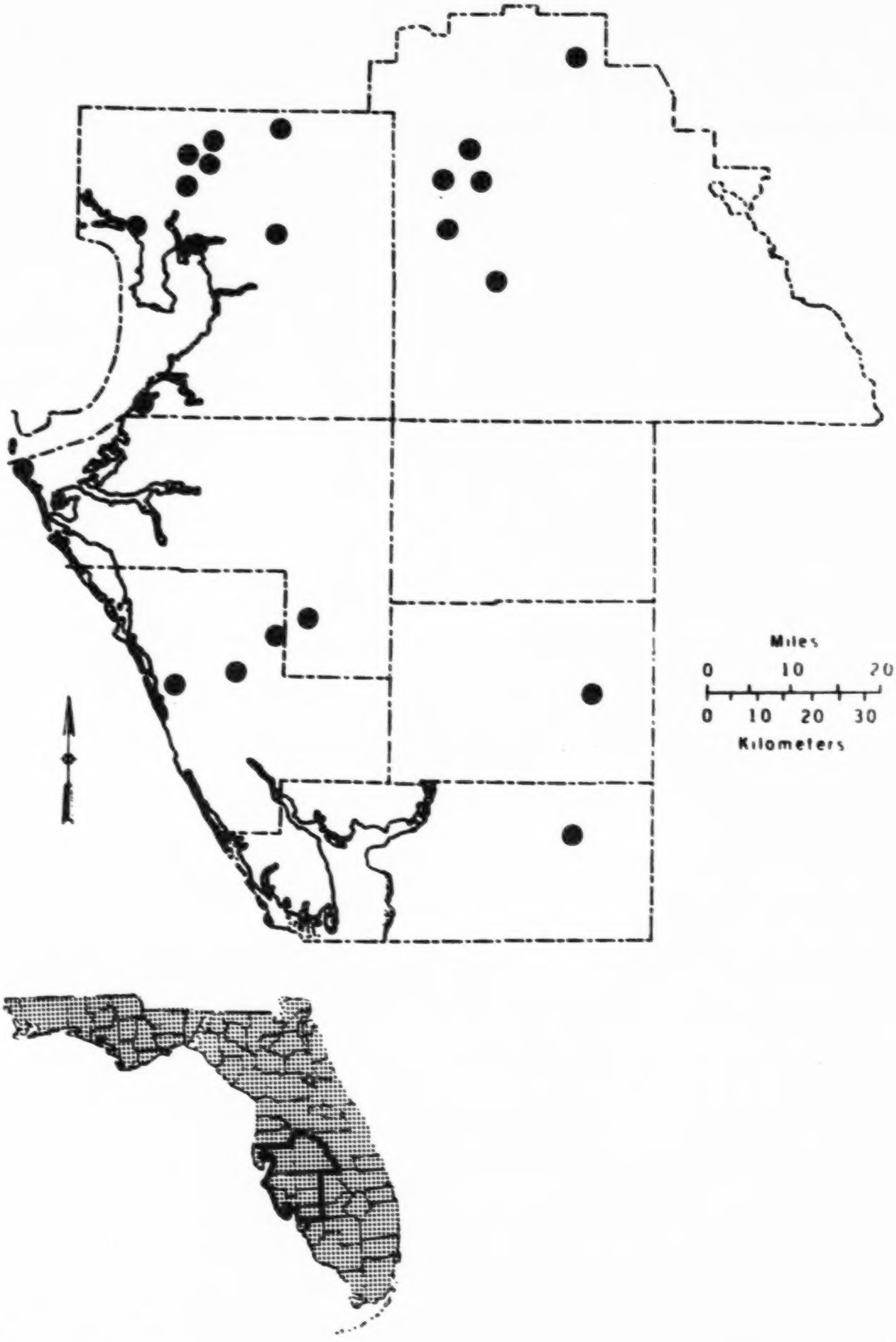
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Fig. VIII.D.101. AMERICAN COOT (Fulica americana)

Listed - Threatened

AMERICAN OYSTERCATCHER — *Haematopus palliatus* Temminck

Order Charadriiformes — Family Haematopodidae

Distribution: Purely marine, the American Oystercatcher is recorded only from the four Gulf coast counties (Charlotte, Hillsborough, Manatee, Sarasota) in the seven-county area. Oystercatchers breed along the entire Florida coast where acceptable habitat exists and northward to New York and west around the Gulf. North of Florida birds leave after breeding and may winter in Florida.

Habitat: Oystercatchers require open beaches for breeding and beaches and oyster bars for feeding. Suitable habitat is lacking along the lower east coast of Florida, in the Keys, and along the Gulf coast from Pasco County north to Wakulla County, therefore the Florida population is concentrated along the north and central Atlantic coast and the central and south Gulf coast. New sparsely vegetated spoil islands are acceptable habitat (R. W. Schreiber and F. M. Dunstan pers. comm.).

Population Status: About 50 pairs breed along the Atlantic coast (DeGange 1976). The Gulf coast population has not been estimated, but, based on the amount of coastline, probably more than half of the Oystercatchers living in Florida breed here (G. E. Woolfenden pers. comm.). About one-quarter of the Gulf coast habitat used by Oystercatchers is along the shoreline of Charlotte, Sarasota, Manatee, and Hillsborough counties.

Breeding pairs space themselves out along suitable beaches. In 1977 Sunken Island, a 25 acre spoil island in Tampa Bay, had seven active nests in July (J. Rodgers pers. comm.). Non-breeders, which probably include birds from north of Florida, in all likelihood account for flocks seen in winter. In July 1977 J. Rodgers (pers. comm.) saw 47 Oystercatchers in one flock in Tampa Bay, Hillsborough County. Most of the 75 Oystercatchers reported on the St. Petersburg Christmas Bird Count in nearby Pinellas County in 1976 were in a single flock (G. E. Woolfenden pers. comm.).

Basis for Priority Status: This species is listed as Threatened by the Florida Committee on Rare and Endangered Plants and Animals and the Florida Game and Fresh Water Fish Commission and is included on the 1977 Blue List of the National Audubon Society because of the vulnerability of its habitat. In recent years the species has shown an apparent increase in the northernmost part of its breeding range, but a continuing decline is occurring in more southerly regions (Arbib 1977).

Potential Impacts of Mining: Any mining activities, direct or indirect that would encroach on marine shorelines or estuaries would have an adverse effect on the status of this species, as will increased human use of open beaches.

Selected References:

*Arbib, R. 1977. The Blue List for 1977. Am. Birds 30(6):1031-1039.

*DeGange, A. R. 1976. American Oystercatcher, Pages 769-772 in Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

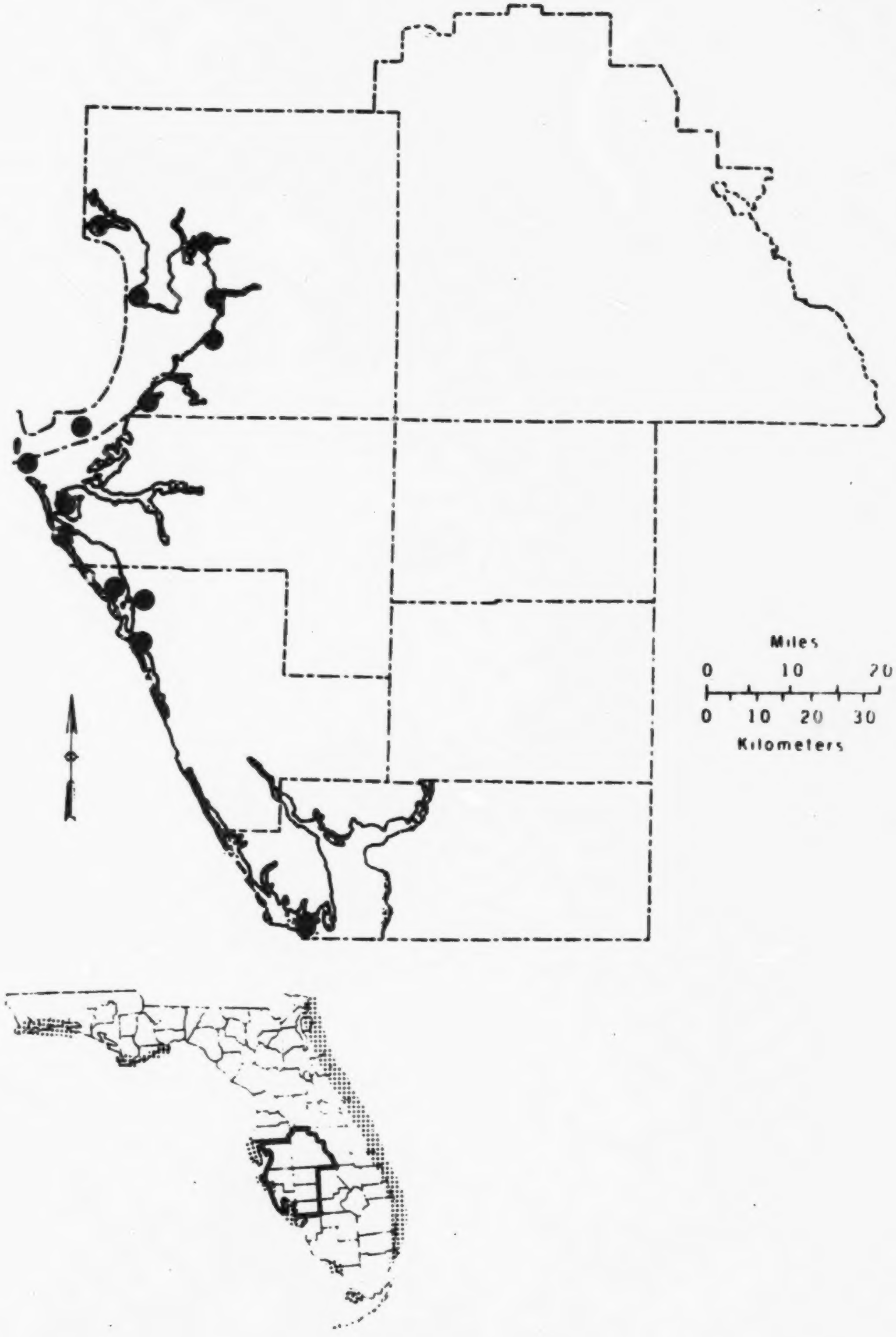
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Fig. VIII.D.102. AMERICAN OYSTERCATCHER (*Haematopus palliatus*)

Listed - Species of Special Concern, Blue List

PIPING PLOVER | Charadrius melodus Ord

Order Charadriiformes | Family Charadriidae

Distribution: The Piping Plover has been recorded from three (Hillsborough, Sarasota, and Manatee) of the coastal counties in the seven-county area. A number of sightings have been made on Christmas Bird Counts in the Venice, Sarasota (Sarasota County), Bradenton (Manatee County), and Tampa (Hillsborough County) areas. Other records from Hillsborough County (Tampa Bay) include DuMont (1930) and G. E. Woolfenden (pers. comm.). In Florida, the species occurs as a winter resident or migrant in suitable areas along the entire Gulf and Atlantic coasts (Woolfenden 1976). It occurs from July to May (Stevenson 1976). The subspecies C. m. melodus appears to be the usual race occurring in the state, but C. m. circumcinctus has also been collected in Florida (Stevenson and Baker 1970). The species breeds in the interior of northern North America and along the Atlantic coast southward to Virginia (Woolfenden 1976).

Habitat: In Florida, Piping Plovers are restricted to outer beaches, extensive sand fills, and large tidal flats.

Population Status: Based on Christmas Bird Count data, the best single source of information on the status of the species in the seven-county area, the Piping Plover is uncommon and local in the region. However, numbers as high as 38 individuals have been recorded on Christmas Bird Counts (Bradenton, 1975). Probably not more than several hundred Piping Plovers winter in the entire state (Woolfenden 1976). However, this number probably surpasses that in any other state.

Basis for Priority Status: This species is listed as a Species of Special Concern by the Florida Committee on Rare and Endangered Plants and Animals and is included on the 1977 Blue List of the National Audubon Society. Florida ranks high as an important wintering area for the species and increasing, intensive human use of beaches and other coastal environments utilized by Piping Plovers may have a deleterious effect on the species.

Potential Impacts of Mining: Only potential direct or indirect effects on coastal environments are of concern. Any effect that would reduce the amount of or integrity of beach, tidal flats, and other such habitats would pose a threat to the population of this species.

Selected References:

*DuMont, P. A. 1930. Abundance of wintering Limicolae on the Florida west coast. Auk 47(2):247-248.

*Stevenson, H. M. 1976. Vertebrates of Florida, identification and distribution. Univ. Presses of Fla., Gainesville. 607 pp.

*Stevenson, H. M., and W. W. Baker. 1970. Records of new avian subspecies in Florida. Fla. Nat. 43:69-70.

*Woolfenden, G. E. 1976. Piping Plover, Pages 874-876 in Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

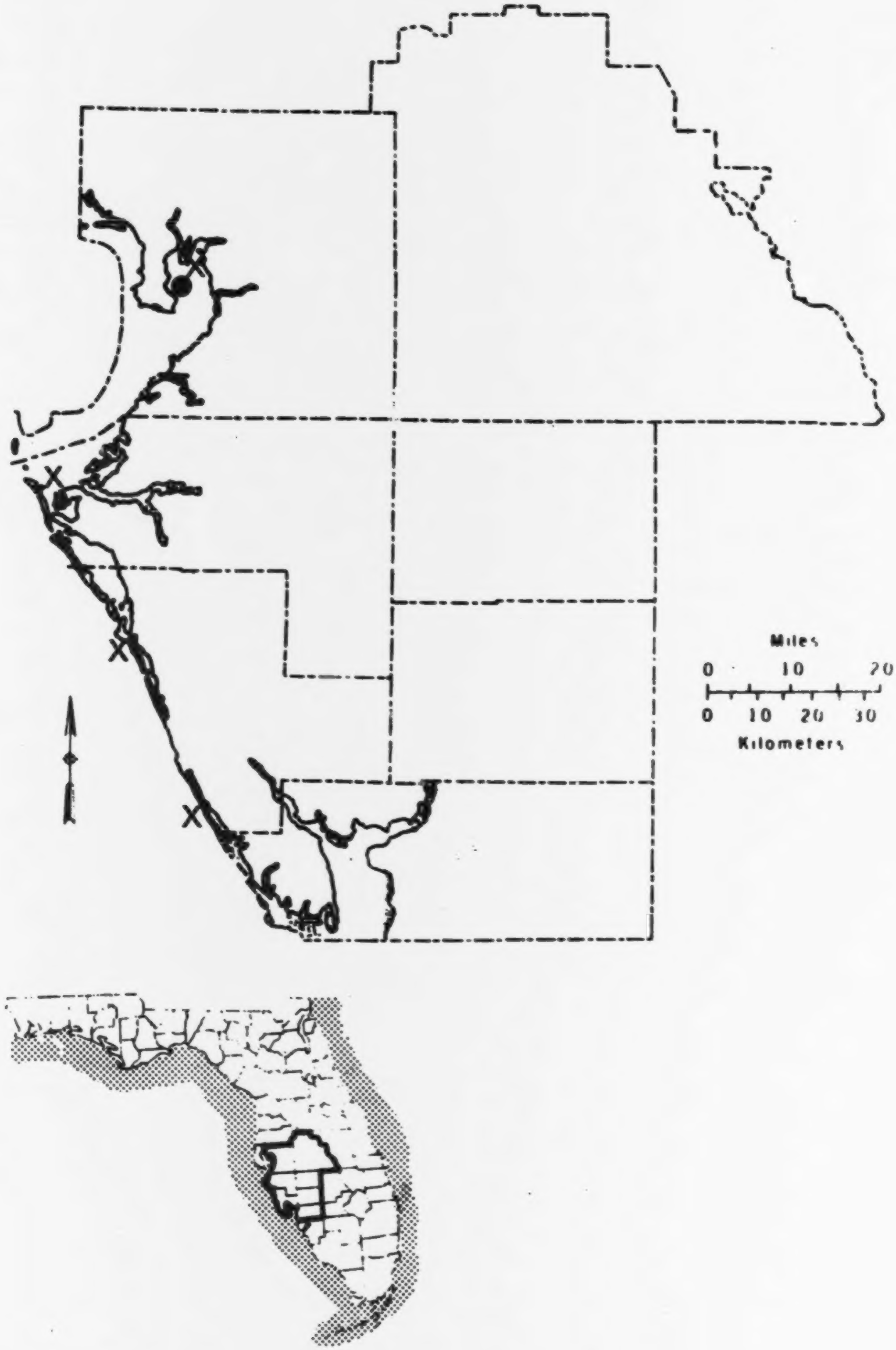
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Fig. VIII.D.103. PIPING PLOVER (Charadrius melodus)

Listed - Endangered

CUBAN SNOWY PLOVER

Charadrius alexandrinus tenuirostris (Lawrence)

Order Charadriiformes

Family Charadriidae

Distribution: The Snowy Plover occurs in the four coastal counties (Charlotte, Hillsborough, Manatee, Sarasota) of the seven-county area. The subspecies Charadrius alexandrinus tenuirostris breeds along the coast of the Gulf of Mexico from Louisiana to Florida and also in Cuba and St. Croix and probably other West Indian islands. Another subspecies, C. a. nivosus, inhabits western and interior North America (AOU 1957).

Habitat: Snowy Plovers in Florida require expansive open, dry sandy beaches for breeding. They forage on both dry and tidal sand flats.

Population Status: The Snowy Plover is rare in the seven-county area, as well as the state in general. No population censuses are available but based on scattered reports and amount of suitable habitat remaining, probably only a few pairs remain in Charlotte, Sarasota and Manatee counties. It is unlikely that more than 100 pairs now breed in Florida (Woolfenden 1976).

Basis for Priority Status: This bird is listed as Endangered by the Florida Committee on Rare and Endangered Plants and Animals and the Florida Game and Fresh Water Fish Commission and is included on the 1977 Blue List of the National Audubon Society. Habitat loss through heavy use by humans explains the decline of Snowy Plovers along the Gulf coast.

Potential Impacts of Mining: No potential impact inland. Any human activity, mining or otherwise, that further disturbs outer beaches and extensive tidal flats would be deleterious to this species.

Selected References:

*American Ornithologists' Union. 1957. Check-list of North American birds. The Lord Baltimore Press. Baltimore, Maryland. 691 pp.

*Woolfenden, G. E. 1976. Snowy Plover, Pages 683-686 in Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

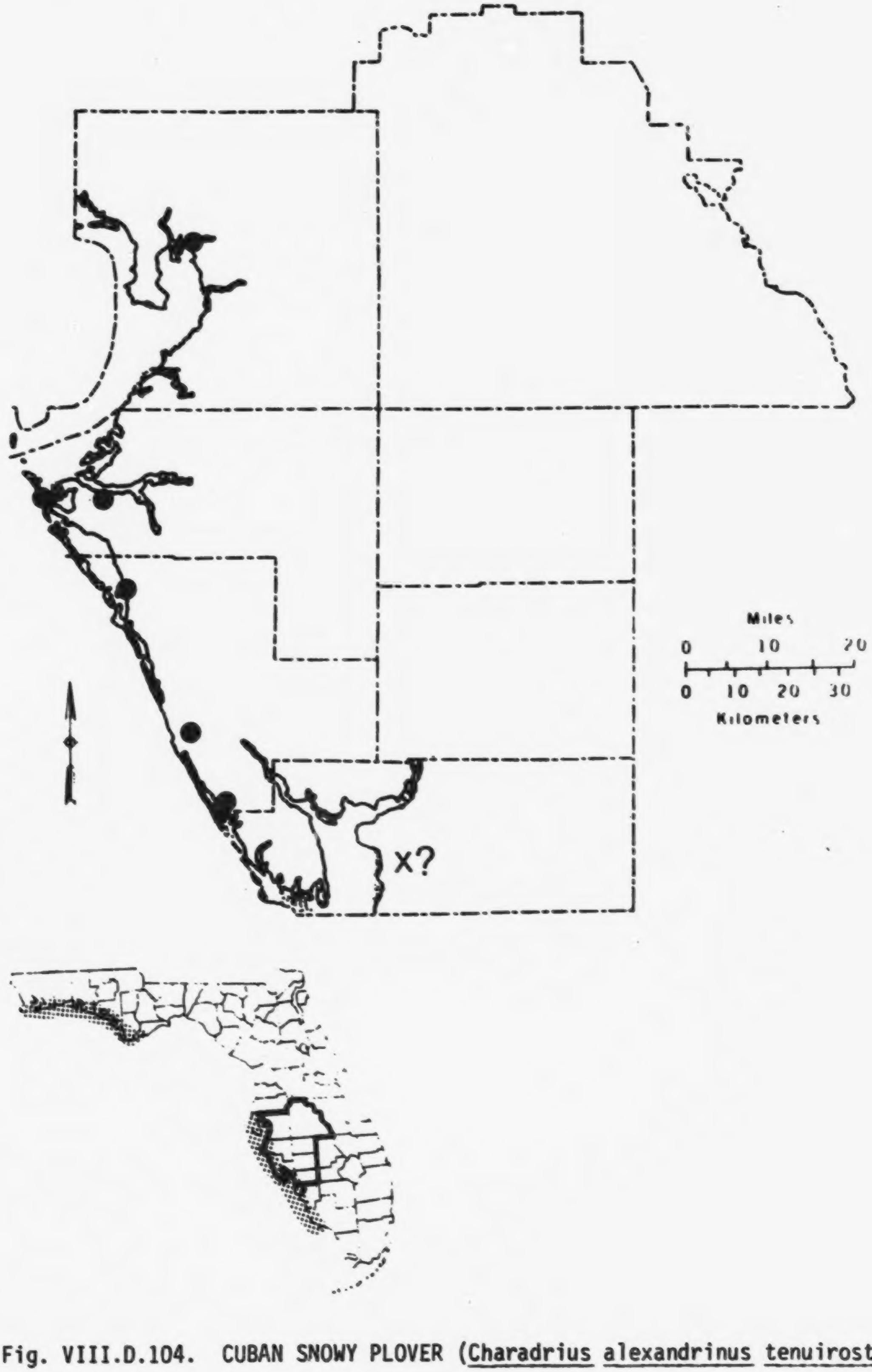
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Fig. VIII.D.104. CUBAN SNOWY PLOVER (Charadrius alexandrinus tenuirostris)

Game

AMERICAN WOODCOCK | Philohela minor (Gmelin)
Order Charadriiformes | Family Scolopacidae

Distribution: Recorded for five of the seven counties in the study area (DeSoto, Hillsborough, Manatee, Polk, Sarasota), the American Woodcock probably occurs throughout the region in suitable habitat. The southern limits of the breeding range are poorly known and perhaps poorly defined, but one old nest record exists for Hillsborough County (Howell 1932). Virtually all Woodcocks found in peninsular Florida are winter residents, arriving in November and departing in February. The Woodcock breeds throughout the eastern United States and southern Canada and winters on the coastal plain. The species is scarce south of Orange County. Thus, although a game species, the Woodcock is rarely hunted in the seven-county area.

Habitat: Woodcocks reside in moist forests during the day. At least some individuals forage in open habitats, such as moist fields and pastures at night.

Population Status: Woodcocks usually are silent on their wintering grounds and are solitary and secretive, thus difficult to census. Therefore, the population status in the study area is poorly known. J. B. Edscorn and G. E. Woolfenden (pers. comm.) consider the species to be rare and local in Polk and Hillsborough counties.

Basis for Priority Status: The Woodcock is a game species. No data on numbers harvested within the seven-county area are available. However, in the South Region, which includes the seven-county area, the 1975-76 estimated harvest was 4035 ± 3683, about 30 percent of the estimated state total

(Conklin 1977). Calculated minimum annual harvests in Florida from 1964-65 to 1968-69, based on the admittedly inadequate data of MacDonald and Martin (1971), range from 2845 to 6099.

Potential Impacts of Mining: Any activity that would reduce the acreage of moist woodlands in the seven-county area would have a direct effect on local Woodcock populations.

Selected References:

*Conklin, E. J. 1977. Wildlife inventory, harvest and economic survey. Fla. Game and Fresh Water Fish Comm. Job Performance Rept. 1-A-1. 2 pp.

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

*MacDonald, D., and E. Martin, compilers. 1971. Trends in harvest of migratory game birds other than waterfowl 1964-1965 to 1968-69. Bur. of Sport Fisheries and Wildl. Spec. Sci. Rept. Wildl. No. 142, Washington, D. C. 29 pp.

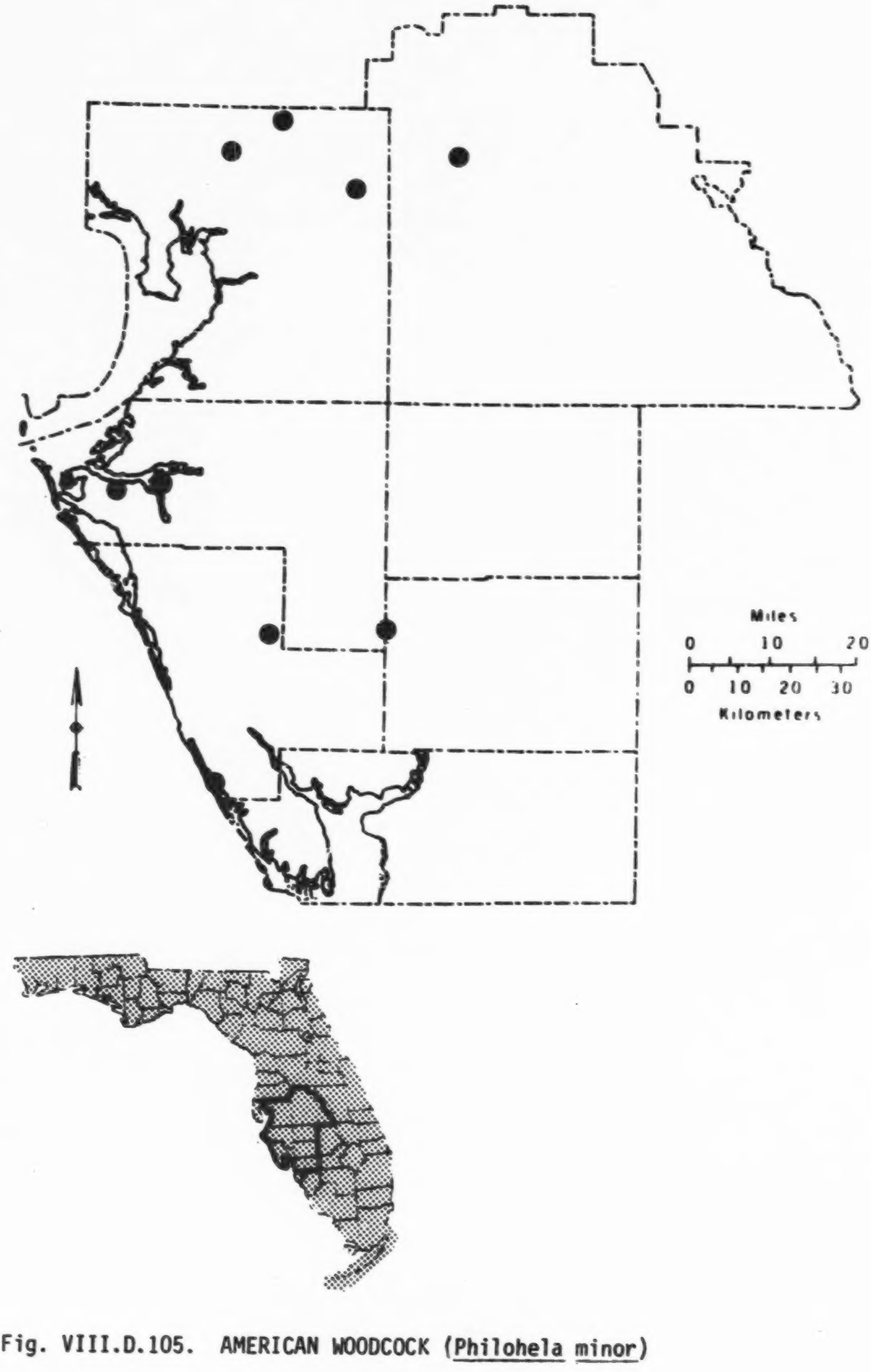
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Fig. VIII.D.105. AMERICAN WOODCOCK (*Philohela minor*)

Game

COMMON SNIPE *Capella gallinago* (Linnaeus)

Order Charadriiformes Family Scolopacidae

Other Names: Wilson's Snipe, Jack Snipe

Distribution: The Common Snipe is a winter resident and generally distributed throughout the seven-county area. The species departs by April for its breeding grounds throughout most of Canada and the extreme northern United States. It moves south by October to winter in the southern half of the United States on southward (Robbins *et al*. 1966). Winter populations in eastern North America are concentrated along the coastal plain, including all of Florida.

Habitat: The Common Snipe is primarily a freshwater wetlands bird inhabiting non-forested, sparsely vegetated or short-grass marshes, where it feeds by probing with its long flexible bill. The Christmas Bird Count analysis reveals the Snipe's preference for freshwater habitats, in that Bradenton and Sarasota record the fewest individuals per 10 party hours (Table VIII.D.5).

Population Status: In acceptable habitat the Common Snipe is a common winter resident in the seven-county area. Specific harvest figures are not available for the seven-county area. In the South Region, which includes the seven-county area, the estimated harvest in 1975-76 was 7095 ± 2094, compared with 22,941 ± 3353 for the state as a whole (Conklin 1977). More Snipe were harvested in this region than in any of the other four regions of the state. Based on MacDonald and Martin's (1971) data, minimum annual harvests of this species in Florida from 1964-65 to 1968-69 varied from 44,600 to 72,559. In number of hunters and number killed, the Snipe was second among the non-waterfowl species (Snipe, Mourning Dove, American

Woodcock, Sora Rail, other rails, Gallinule) treated by MacDonald and Martin.

Basis for Priority Status: The Common Snipe is an important game bird in Florida, whose numbers are dependent on the amount of wetland habitat available. Halls and Stransky (1971) estimate that 11,000,000 snipe winter in Florida.

Potential Impacts of Mining: The Common Snipe is one of numerous bird species that are widely distributed in herbaceous wetland habitats. Elimination of such habitats would be detrimental to the species. Slime ponds apparently do not provide good habitat, and the types of wetlands (deep, steep-sided ponds and lakes) currently created in reclamation would be unsuitable for this species.

Selected References:

*Conklin, E. J. 1977. Wildlife inventory, harvest and economic survey. Fla. Game and Fresh Water Fish Comm. Job Performance Rept. 1-A-1. 2 pp.

*Halls, L. K., and J. J. Stransky. 1971. Atlas of southern forest game. Southern Forest Exp. Sta. 24 pp.

*MacDonald, D., and E. Martin, compilers. 1971. Trends in harvest of migratory game birds other than waterfowl 1964-65 to 1968-69. Bur. of Sport Fisheries and Wildl. Spec. Sci. Rept. Wildl. No. 142, Washington, D. C. 29 pp.

*Robbins, C. S., B. Bruun, and H. S. Zim. 1966. Birds of North America. Golden Press, New York. 340 pp.

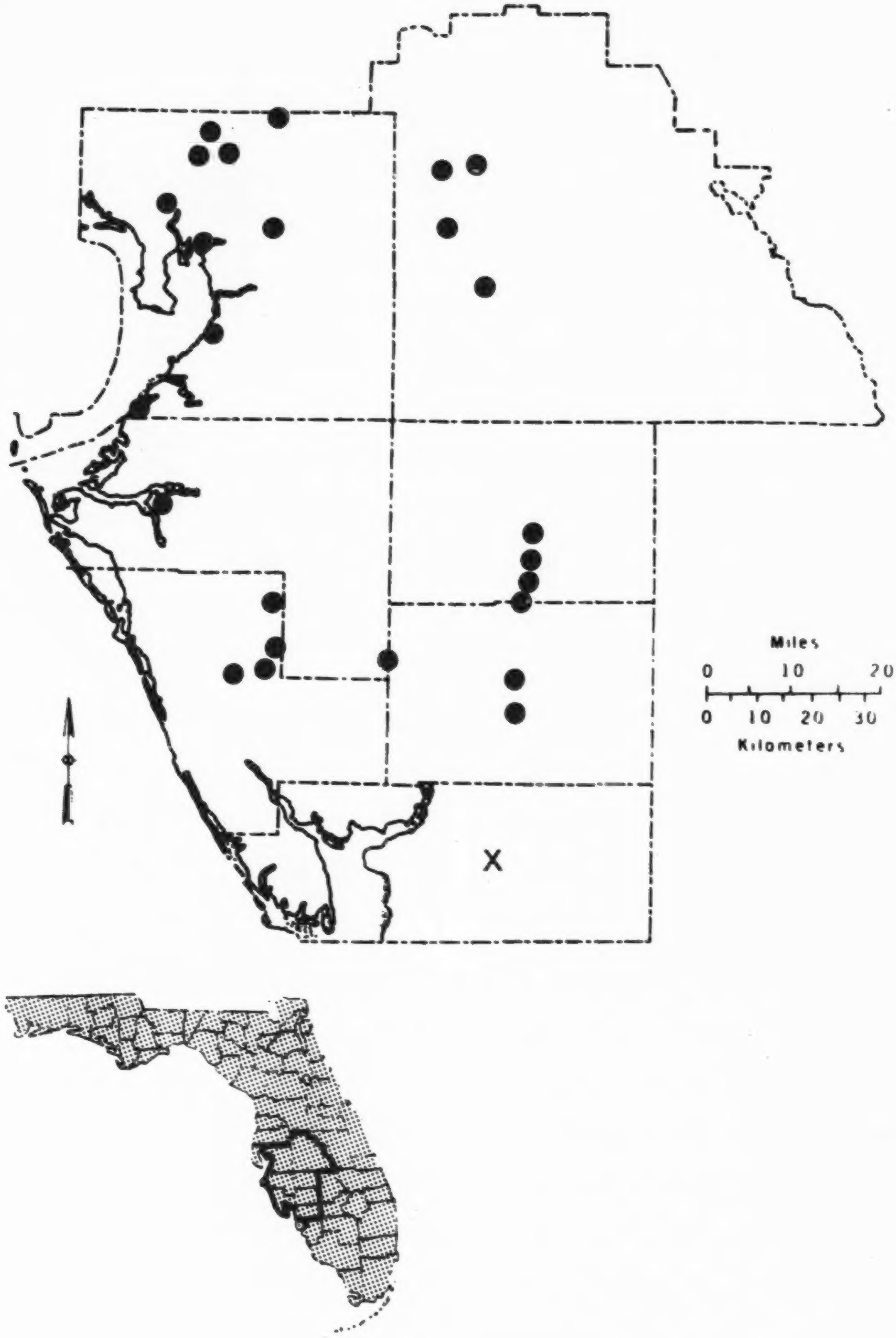
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Fig. VIII.D.106. COMMON SNIPE (Capella gallinago)

Listed - Blue List

UPLAND SANDPIPER Bartramia longicauda (Bechstein)

Order Charadriiformes Family Scolopacidae

Other Names: Upland Plover

Distribution: The Upland Sandpiper has been reported occasionally from all counties of the seven-county area with the exception of Hardee. It occurs as a migrant in Florida from July to September and March to May. It breeds from northern Alaska, western and southern Canada and across the north central and northeastern United States, and winters in South America.

Habitat: This is a bird of open grasslands and prairies, where it feeds chiefly on insects. It also occurs on man-modified grasslands such as golf courses (Hewitt 1976) and air fields (Platt 1958).

Population Status: This species, a rare migrant in Florida today, formerly was abundant. Howell (1932) considered it declined because of unrestricted hunting and loss of habitat. Sprunt (1954) noted an increase in numbers, but its occurrence in the state is still infrequent and irregular.

Basis for Priority Status: The 1977 Blue List includes this species on the basis of its decreasing numbers and restricted breeding range which once extended farther south.

Potential Impacts of Mining: This species is too infrequent in the seven-county area and state generally to be significantly affected by mining. Extensive, dry open grasslands produced in reclamation projects would be potential habitat.

Selected References:

Bent, A. C. 1929. Life histories of North American shore birds.

(Part 2). U. S. Nat. Mus. Bull. 146.

Grimm, W. C. 1953. Spirit bird of the grasslands. Aud. Mag. 55: 152-155.

*Hewitt, O. H. 1976. Fieldbook of birds of the Florida suncoast. Mote Marine Lab., Sarasota, Florida. 150 pp.

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

*Platt, F. F. 1958. Upland Plover (Bartramia longicauda). Fla. Nat. 32(4):136.

*Sprunt, A., 1954. Florida bird life. Coward-McCann, Inc., New York. 527 pp.

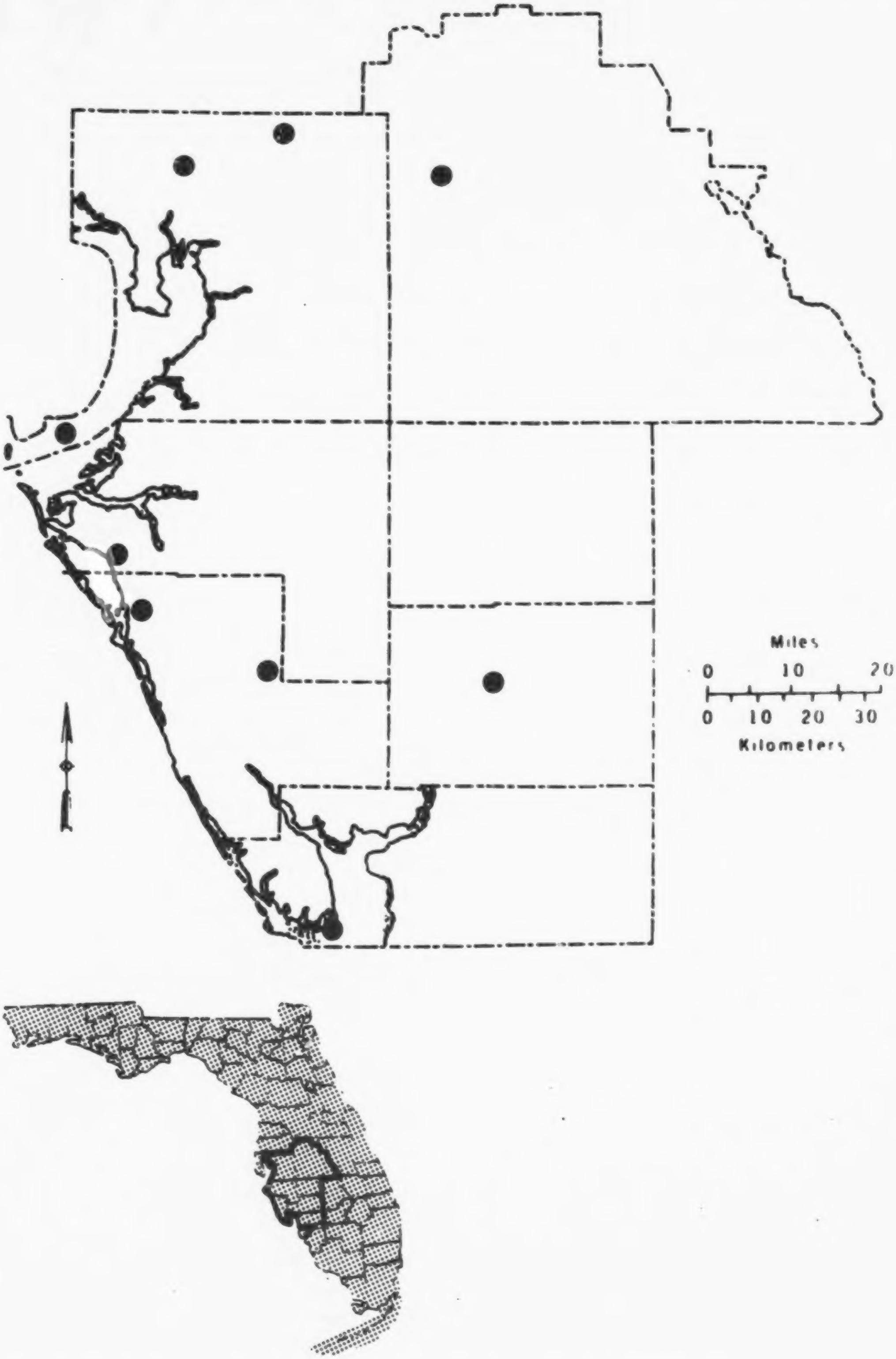
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Fig. VIII.D.107. UPLAND SANDPIPER (*Bartramia longicauda*)

Listed - Species of Special Concern

AMERICAN AVOCET — *Recurvirostra americana* Gmelin

Order Charadriiformes — Family Recurvirostridae

Distribution: Though records exist for four counties (Hillsborough, Manatee, Polk, Sarasota), the Avocet is found regularly at only one locality in the study area, McKay Bay in upper Tampa Bay. The Avocet breeds in western North America, but non-breeders are found in Florida year-round. Everglades National Park is a favored locality south of the study area (Woolfenden and Schreiber 1973). Probably the species reaches its highest numbers there.

Habitat: In Florida, Avocets are rarely found anywhere but on expansive, muddy tidal flats. The species is extremely rare in the Lakeland region, for example (J. B. Edscorn pers. comm.), where freshwater "mudflats" produced by phosphate mining exist.

Population Status: As many as 400 Avocets have been seen at McKay Bay in winter (Courser 1976) and 150 in summer (W. B. Courser pers. comm.). Based on the 1972-1977 Tampa Christmas and Summer Bird Counts, Avocets average over 210 in winter and 64 in summer. Though locally common, the species is rare or unrecorded elsewhere in the seven-county area.

Basis for Priority Status: The Florida Committee on Rare and Endangered Plants and Animals lists the American Avocet as a Species of Special Concern because of its extreme habitat specificity and the fact that its habitat is particularly vulnerable to alteration by man.

Potential Impacts of Mining: Any coastal effects of mining or related activities that impinge on tidal mudflats could affect the status of the Avocet. Inland mining activities seem unlikely to have any significant impact. Creating of extensive bare flats in phosphate settling areas might somewhat increase probabilities of occurrence of Avocets in the interior.

Selected References:

*Courser, W. B. 1976. Christmas Bird Count. Am. Birds 30(2):262.

*Woolfenden, G. E., and R. W. Schreiber. 1973. The common birds of the saline habitats of the eastern Gulf of Mexico: their distribution, seasonal status, and feeding ecology, Pages IIIJ-1 - IIIJ-21 in A summary of knowledge of the eastern Gulf of Mexico 1973. State Univ. System of Fla. Inst. of Oceanography, St. Petersburg, Florida.

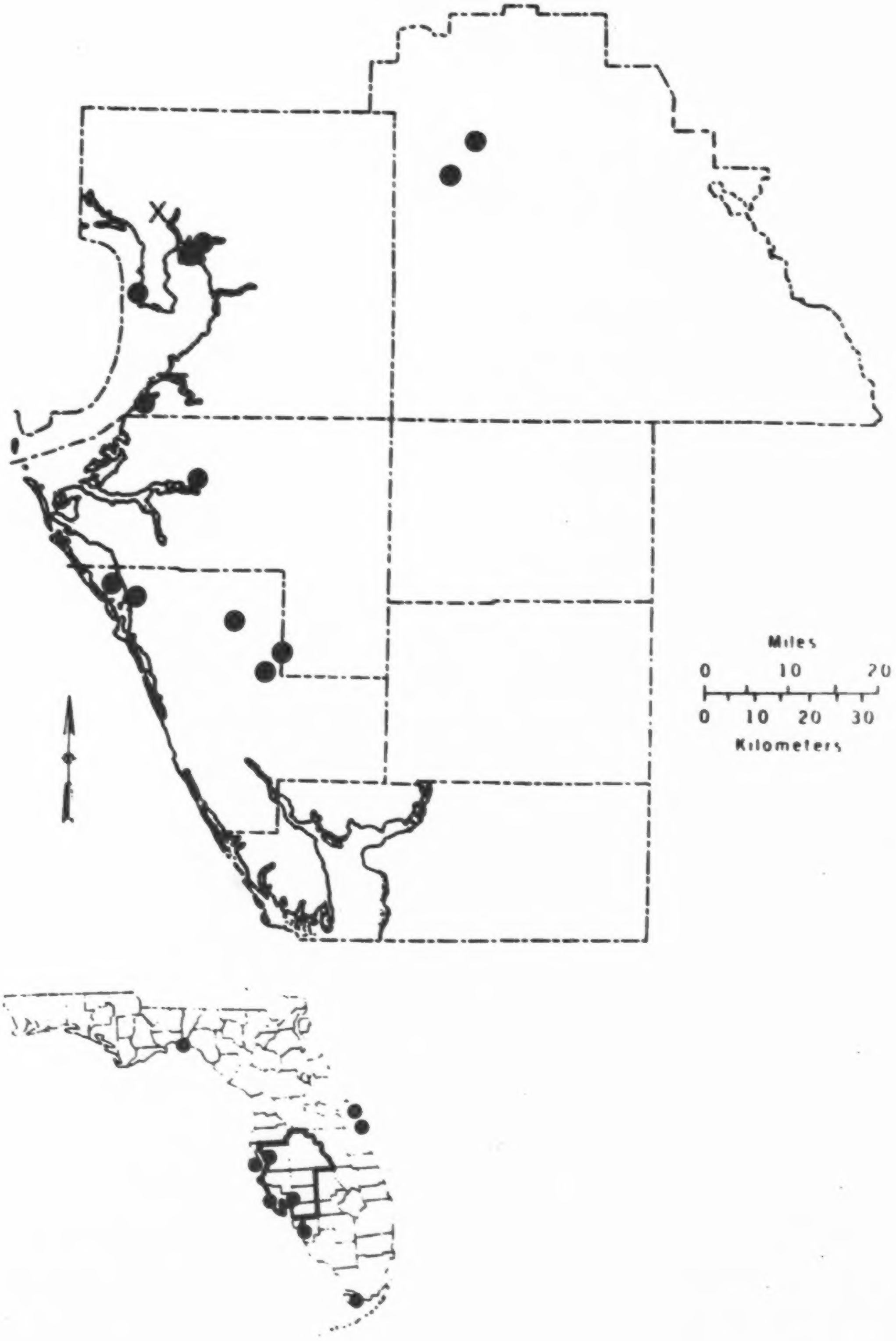
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Fig. VIII.D.108. AMERICAN AVOCET (Recurvirostra americana)

Listed - Blue List

GULL-BILLED TERN *Gelochelidon nilotica* (Gmelin)

Order Charadriiformes Family Laridae

Distribution: At present the Gull-billed Tern is found in the study area only as a transient. Records exist for DeSoto, Hillsborough and Polk counties, and one record from Myakka River State Park (Manatee and Sarasota counties). Now an extremely rare vagrant in Polk County, in the 1960's the species nested on sand fills at localities mined for phosphate (J. B. Edscorn pers. comm.).

Gull-billed Terns were first recorded as breeding in Florida in the 1930's. Being found inland as well as coastally, and being quick to nest on new fills, the species' breeding distribution is difficult to follow. In recent years, it has nested near Lake Okeechobee southeast of the study area and in Duval County on the Atlantic coast and along the panhandle on the Gulf coast. Nesting occurred on a fill on the coast of adjacent Pinellas County (Woolfenden and Rohwer 1969) which strongly suggests the species could breed in similar habitat along the coast of the seven-county area.

Outside Florida in the United States, Gull-billed Terns breed north to New Jersey and west along the Gulf coast to Texas. The race *G. n. aranea* also breeds at scattered localities in the West Indies. Other races occur at scattered localities on other continents.

Habitat: In Florida, though apparently not elsewhere in eastern North America, Gull-billed Terns occur and nest inland. Habitats used for foraging include interior wetlands and nearby drier fields, and coastal beaches, mudflats, and man-made bare or sparsely vegetated fills. In southern Florida the coastal habitats are preferred (Robertson and Kushlan 1974). In contrast to most terns, subfamily Sterninae, Gull-billed Terns frequently feed on terrestrial insects and even small vertebrates. In Pinellas County adjacent to the seven-county area a few pairs nested among Black Skimmers on a barren fill in Boca Ciega Bay. These breeders ignored the adjacent estuary and foraged over fields and shrubs (Rohwer and Woolfenden 1968).

Population Status: Gull-billed Terns are rare anywhere in the seven counties. None nest there at present, so far as known, and thus the species occurs only as a migrant. During the past few years several hundred pairs have nested with other terns and skimmers in Duval County (R. W. Loftin pers. comm.). Also within the last several years, pairs have been found breeding inland near Zellwood, Orange County, and in the panhandle. Gull-billed Terns are rare along the Gulf coast of Florida in winter (Woolfenden and Schreiber 1973) and only slightly more frequent in the southern part of the state.

Basis for Priority Status: The Gull-billed Tern is included on the 1977 Blue List of the National Audubon Society. Florida is one of about ten states where the species breeds, and for the Atlantic race Florida is the only state with inland nesting populations. Nesting in the seven-county area, although not documented, is possible at present and in the future.

Potential Impacts of Mining: Inland or coastal activities associated with mining that produce flat, barren areas might have a positive impact on the species by providing potential nest sites, particularly if suitable feeding areas were available.

Selected References:

*Robertson, W. B., Jr. and J. A. Kushlan. 1974. The southern Florida avifauna, Pages 414-452 in Gleason, P. J., ed., Environments of south Florida: present and past. Miami Geol. Soc. Memoir 2. 452 pp.

*Rohwer, S. A., and G. E. Woolfenden. 1968. The varied diet of the Gull-billed Tern includes a shrub-inhabiting lizard. Wilson Bull. 80:330-331.

*Woolfenden, G. E., and S. A. Rohwer. 1969. Breeding birds in a Florida suburb. Bull. Fla. State Mus. 18(1):1-83.

*Woolfenden, G. E., and R. W. Schreiber. 1973. The common birds of the saline habitats of the eastern Gulf of Mexico: their distribution, seasonal status, and feeding ecology, Pages IIIJ-1 - IIIJ-21 in A summary of knowledge of the eastern Gulf of Mexico 1973. State Univ. System of Fla. Inst. of Oceanography, St. Petersburg, Florida.

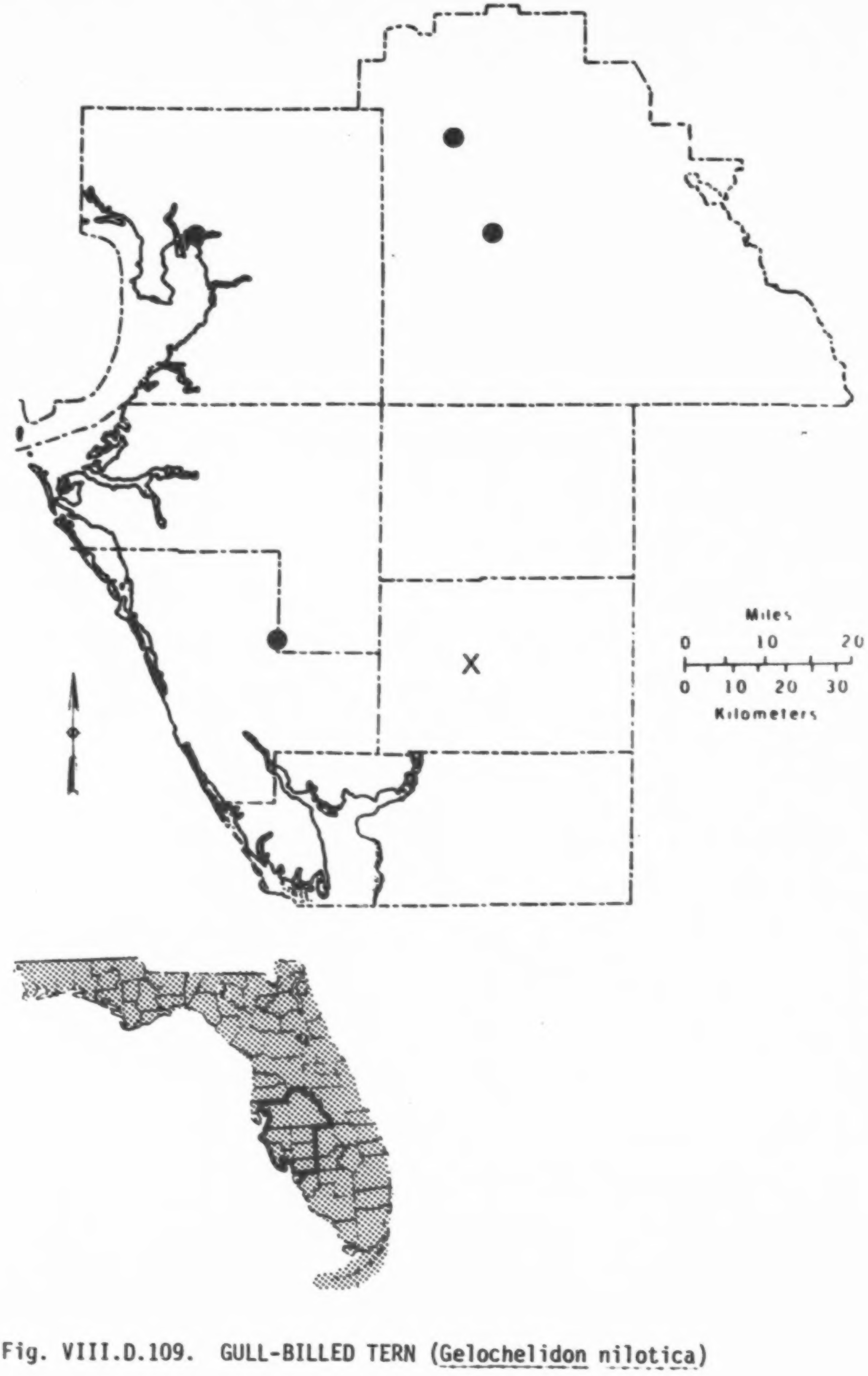
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Fig. VIII.D.109. GULL-BILLED TERN (*Gelochelidon nilotica*)

Listed - Threatened

ROSEATE TERN — Sterna dougallii Montagu

Order Charadriiformes — Family Laridae

Distribution: The status of the Roseate Tern in the seven-county area is poorly known, primarily because of the difficulty of distinguishing this species from two similar shore terns, the Common Tern (*S. hirundo*) and Forster's Tern (*S. forsteri*) of which the latter is regular along the Gulf coast and even inland (Cruickshank 1974). The coastal records of T. Brungardt (pers. comm.), who lists no Forster's Terns, and on the Bradenton Christmas Bird Count (1971), which was questioned by the editor, are highly suspect as are the inland records at Myakka River State Park (Van Duyn 1941). Hewitt's (1976) status report of "a very rare winter visitor" is not supported with any details on observations.

The Roseate Tern probably does occur along the Gulf coast of the seven-county area as a rare migrant. Howell (1932) cites a specimen from Johns Pass in nearby Pinellas County. Two recent sight records deemed valid by regional editors were of two individuals at Anna Maria, Manatee County, 16 April 1960 (Stevenson 1960) and one individual at St. Armand Key, Sarasota County, 6 April 1976 (Kale 1976).

The Roseate Tern breeds at Dry Tortugas and at least intermittently elsewhere in the Florida Keys. The species is rare in winter as far north as Florida. North of Florida, Roseate Terns breed at a very few localities, all coastal, north to Canada (Robertson 1976). The major colonies, which are in New York and Massachusetts, have been decreasing since 1972 (Duffy 1977). The same race breeds on islands in the Caribbean and in Europe and

Africa.

Habitat: Away from breeding sites, Roseate Terns are maritime, probably pelagic, but at least offshore foragers. They feed on small fish caught by plunge diving. The Florida breeding sites are on open or sparsely vegetated beaches and spoil islands.

Population Status: Other than at the breeding sites in the Florida Keys, the Roseate Tern is an extremely rare transient and accidental in winter (Cruickshank 1974).

Basis for Priority Status: The Roseate Tern is listed as Threatened by the Florida Committee on Rare and Endangered Plants and Animals and Florida Game and Fresh Water Fish Commission. Recently it has been proposed the species be added to the Blue List of the National Audubon Society (Duffy 1977).

Potential Impacts of Mining: As it is rare in the seven-county area, mining-related activities, either inland or coastal, are likely to have little effect on the species. Conceivably the Roseate Tern could become a breeder locally on a natural island or spoil island.

Selected References:

*Duffy, D. C. 1977. Communications. Am. Birds 31(2):244.

*Cruickshank, A. D. 1974. Field identification of difficult birds: II. Four similar terns. Fla. Field Nat. 2:1-3.

*Hewitt, O. H. 1976. Fieldbook of birds of the Florida suncoast. Mote Marine Lab., Sarasota, Florida. 150 pp.

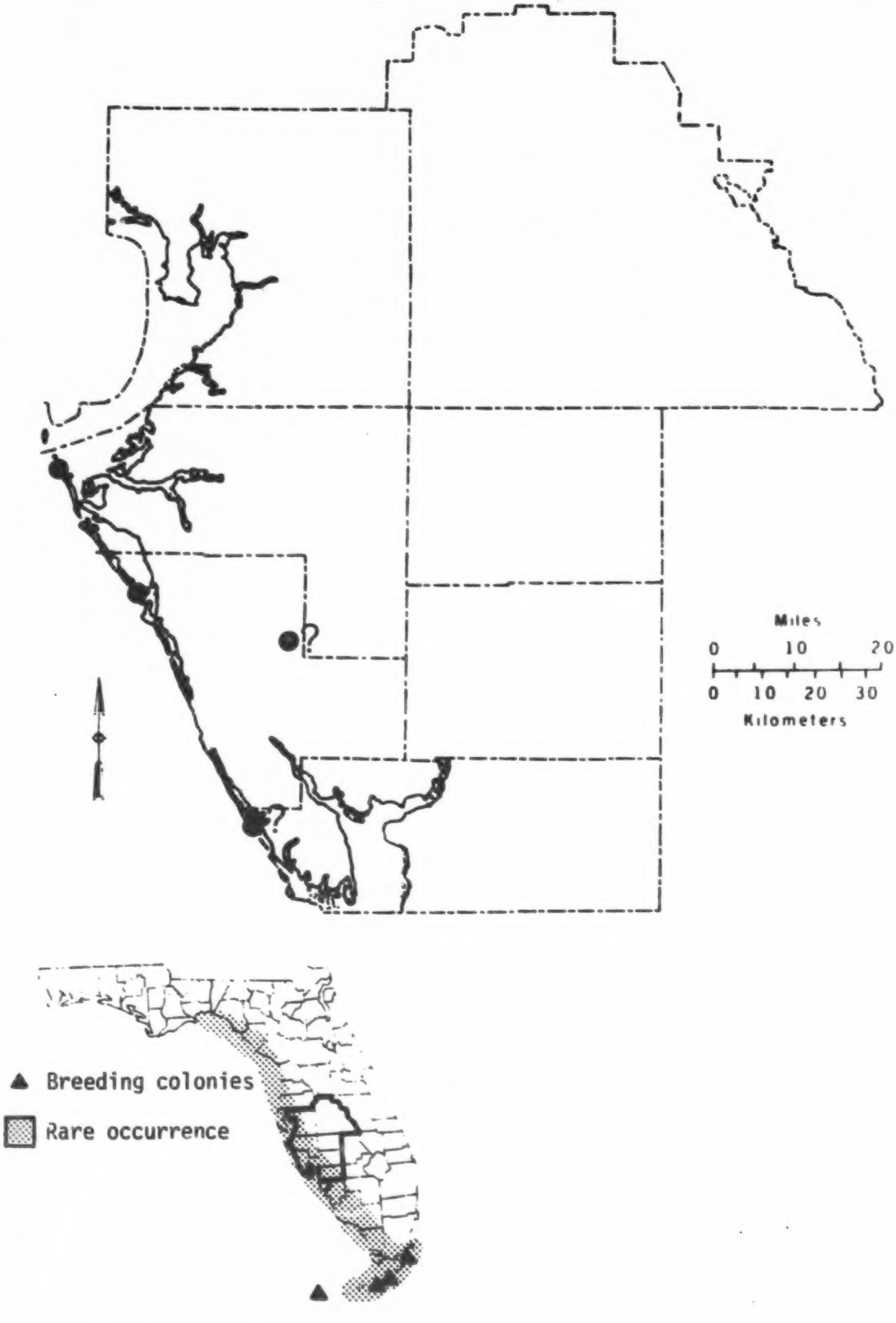
*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

*Kale, H. W. 1976. Florida region. Am. Birds 30(4):828-832.

*Robertson, W. B., Jr. 1976. Roseate Tern, Pages 773-777 _in_ Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

*Stevenson, H. M. 1960. A key to Florida birds. Peninsular Publishing Co., Tallahassee, Florida. 158 pp.

*Van Duyn, G. 1941. Progress report of biological reconnaissance Myakka River State Park, Florida (FLA SP-4) with preliminary checklists of vertebrate fauna. 25 pp.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Miles
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Kilometers
▲ Breeding colonies
▨ Rare occurrence

Fig. VIII.D.110. ROSEATE TERN (Sterna dougallii)

Listed - Species of Special Concern

SOOTY TERN | *Sterna fuscata* Linnaeus

Order Charadriiformes | Family Laridae

Other Names: Wideawake, Egg Bird, Hurricane Bird

Distribution: Only one record of the Sooty Tern exists for the study area. Four were seen in Charlotte Harbor, Charlotte County (Hewitt 1976). The only breeding colony in Florida is at Dry Tortugas, Monroe County. Sooty Terns also nest in small numbers and perhaps only intermittently, on islands off Texas and Louisiana, and abundantly in the Caribbean. Several races are recognized, and the species is pantropical (Robertson 1976).

Habitat: Sooty Terns are pelagic except at the breeding colony. Breeding colonies are on remote islands.

Population Status: Accidental in the study area, Sooty Terns occasionally occur along Gulf shores in low numbers as stragglers after storms.

Basis for Priority Status: The Sooty Tern is listed as a Species of Special Concern by the Florida Committee on Rare and Endangered Plants and Animals because, although common, it breeds only on one small island. Probably no place in Florida other than at Dry Tortugas is suitable for Sooty Tern breeding.

Potential Impacts of Mining: There is no reason to suspect that mining activities in the seven-county area would affect this species.

Selected References:

*Hewitt, O. H. 1976. Fieldbook of birds of the Florida suncoast. Mote Marine Lab., Sarasota, Florida. 150 pp.

*Robertson, W. B., Jr. 1976. Sooty Tern, Pages 881-887 *in* Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

Listed - Threatened

LEAST TERN　　　　　　　　　　　　　　　*Sterna albifrons* Pallas

Order Charadriiformes　　　　　　　　　　　　　Family Laridae

Other Names: Little Tern

Distribution: Least Tern records exist for six of the counties in the seven-county area. No doubt it also occurs in DeSoto County, most likely at the mouth of the Peace River. The species is present mainly from about April to September and is rare in winter. The breeding range of the subspecies of eastern North America, *S. a. antillarum*, extends from Louisiana to the Dry Tortugas and Key West northward on the Atlantic coast to Massachusetts. The race *S. a. athalassos* breeds in the Mississippi River basin from central Louisiana north to Nebraska, and *S. a. browni* breeds in California (Fisk 1976).

Habitat: Least Terns inhabit most marine waters along the Gulf coast of the seven-county area and often also the larger inland bodies of water. Favored inland localities are lakes with exposed sand bars, beaches, or dry sand flats, which the terns use for resting and nesting. Least Terns feed on small fish taken from salt or fresh water by plunge diving.

The recent habit of nesting on expansive flat gravel roofs, bare spoil islands, and other barren land provides opportunity to supplement natural nesting habitat, which is decreasing because of human disturbance (Fisk 1976). Reproductive success on roof tops requires study to determine their value as nest sites. In 1974 about 100 clutches were seen on Kane's Furniture Store in Sarasota (Hewitt 1976).

Population Status: In season the Least Tern is common along the coast and locally common inland. Excluding estimates of sizes of nesting colonies, the only quantitative data on Least Terns during summer are from the Tampa Summer Bird Count (Table VIII.D.11). During the six years 1972-1977, an average of 294 Least Terns per count day were recorded, which is about 45 per 10 party hours. None have been recorded in winter on the 1971-1976 Tampa Christmas Bird Counts (W. D. Courser pers. comm.). In the Lakeland region, Polk County, Edscorn (unpubl. MS) considers the Least Tern a locally common summer resident from April through July.

Least Terns will nest in colonies of only a few pairs, and colony sites shift from one breeding season to the next, and even within one season following failure. For these reasons estimates of total breeders are difficult. Furthermore, as no facts exist regarding longevity in Least Terns, estimating the population from counts of adults and flying young is of little value. Fisk (1976) maps nesting localities for all four coastal counties in the study area, but provides no population estimates. The Least Tern is a local nester in the Lakeland region. J. B. Edscorn (pers. comm.) mentions large nesting colonies in the Orange Park slime ponds within the last two decades. Evidence of inland nesting in small colonies at temporary sites also comes from Highlands County adjoining the seven-county area on the east (Lohrer and Lohrer 1973, J. N. Layne pers. comm.).

Basis for Priority Status: Listed as Threatened by the Florida Game and Fresh Water Fish Commission and the Florida Committee on Rare and Endangered Plants and Animals, the Least Tern also is included on the 1977 Blue List of the National Audubon Society. The inland (S. a. athalassos) and Pacific coast (S. a. browni) populations are decreasing more rapidly than the local race. The latter bird is on both the federal and California endangered lists. In all cases, loss of habitat to humans is the reason given for the decline.

Potential Impacts of Mining: Mining activities resulting in lowered water quality and reduced aquatic animal life could negatively affect Least Tern foraging habitat. Mining-related activities that produce barren areas, either inland or on the coast, could be beneficial to the species by providing nesting habitat, particularly if suitable feeding areas were in close proximity. On balance, overall mining impacts on this species would probably be positive.

Selected References:

*Edscorn, J. B. Birds of the Lake Region. Unpubl. MS.

*Fisk, E. J. 1976. Least Tern, Pages 778-783 in Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

*Hewitt, O. H. 1976. Fieldbook of birds of the Florida suncoast. Mote Marine Lab., Sarasota, Florida. 150 pp.

*Lohrer, F. E., and C. E. Lohrer. 1973. Inland nesting of the Least Tern in Highlands County, Florida. Fla. Field Nat. 1(1):3-5.

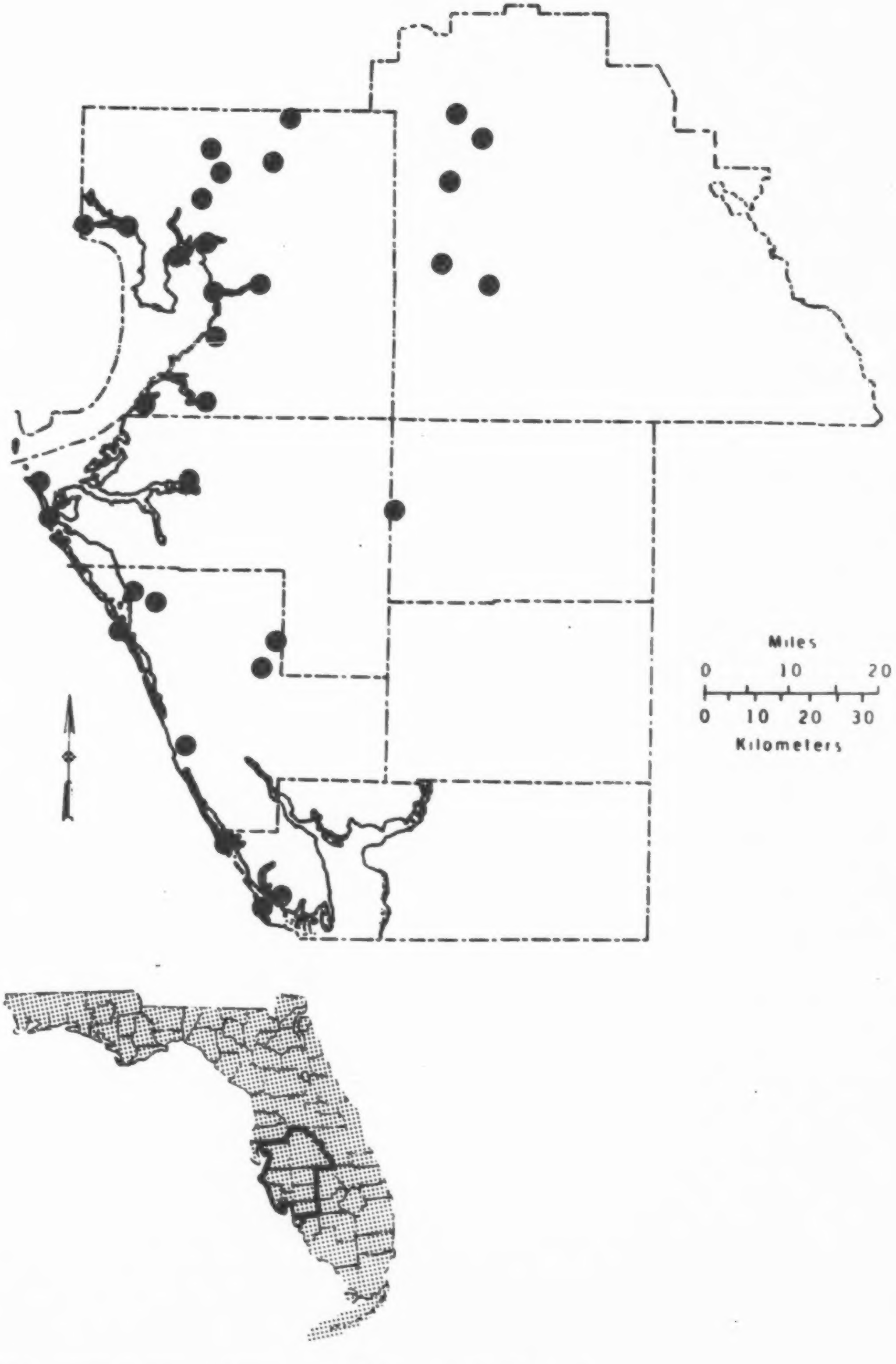
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Fig. VIII.D.111. LEAST TERN (*Sterna albifrons*)

Listed - Species of Special Concern

ROYAL TERN *Sterna maxima* (Boddaert)

Order Charadriiformes Family Laridae

Distribution: The Royal Tern is found throughout the year along the coast of the seven-county area, with records from each of the four coastal counties as well as Polk County in the interior. As a breeder the species extends north to Delaware and around the Gulf to Texas and Mexico. In winter in North America the species is concentrated in Florida (Bystrak 1974).

Habitat: Royal Terns strongly prefer saltwater environs. They forage for fish in bays, offshore in the Gulf of Mexico, and at the mouths of rivers. Non-breeders stray inland to lakes and up rivers, but not far. Rarity farther inland is evidenced by the lack of records of the species from 1974 through 1976 on the Lakeland, Lake Wales and Myakka River State Park Christmas Bird Counts (Table VIII.D.1). Less than ten records are known for the Lakeland region, where the species is listed as an extremely rare vagrant (Edscorn unpubl. MS).

Royal Terns nested along the west coast of peninsular Florida until the late 1800's. Evidence for this includes eggs from Charlotte Harbor collected in the 1850's (USNM no. 985). By the end of the 1800's Royal Terns no longer bred there or perhaps anywhere in Florida. Egging probably brought on their disappearance (Robertson and Kushlan 1974). The species again bred in Florida in 1951, along the panhandle (Hallman 1952). In 1968 a large breeding colony was established near Jacksonville along the Atlantic coast. In 1975 the species was reestablished as a breeder on the peninsular Gulf coast. Barbour saw about 35 old nests and 45 flightless chicks in Citrus County (Barbour and Schreiber 1976) and in the seven-county area Schreiber and Schreiber (1975) found one chick tended by a pair on a spoil island in northern Charlotte County.

Population Status: Royal Terns are common along the coast of the seven-county area throughout the year. Away from the counties bordering the open Gulf, the species is decidedly less common. For example Bradenton, Sarasota and Venice have averaged 10 to 26 individuals per 10 party hours on Christmas Bird Counts during the years 1974-1976, while estuarine Tampa averages but one (Table VIII.D.5).

Royal Terns probably do not breed at age one year. Furthermore, probably all breeders do not breed in a given year or simultaneously in one year. This accounts for Royal Terns being present year round along the Florida coasts. Thus, their presence in an area during "normal" breeding time should not be construed as local breeding.

Basis for Priority Status: The Royal Tern is listed as a Species of Special Concern by the Florida Committee on Rare and Endangered Plants and Animals because it is a tenuous, but potentially persistent breeder in Florida. Recent history strongly suggests the Royal Tern could become established as a breeder in sizable colonies in the seven-county area. Needed for its establishment are islands, artificial or natural, or outer beaches free from human disturbance during the time of breeding.

Potential Impacts of Mining: Inland mining activities affecting water quality of rivers which in turn might reduce productivity of coastal waters could be deleterious to the species, but this is unlikely. Coastal phosphate-related activities causing disturbance of secluded open beaches would be of more concern. Creation of spoil islands could enhance possibilities of establishment of breeding colonies in the seven-county area.

Selected References:

*Barbour, D. B., and R. W. Schreiber. 1976. Royal Tern, Pages 888-891 in Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

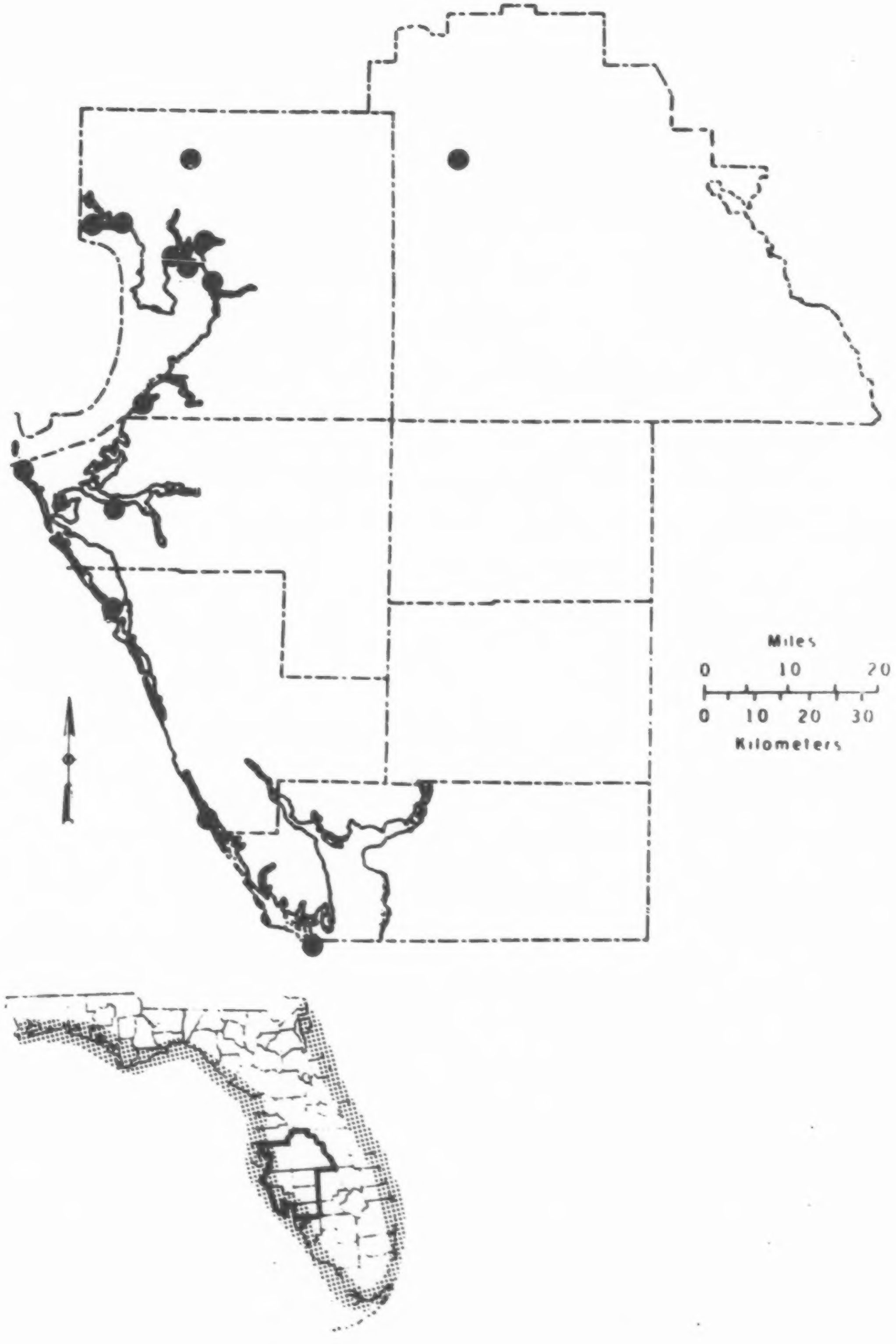
*Bystrak, D. 1974. Wintering areas of bird species potentially hazardous to aircraft. Nat. Aud. Soc. 156 pp.

*Edscorn, J. B. Birds of the Lake Region. Unpubl. MS.

*Hallman, R. C. 1952. Royal Tern nesting near Port St. Joe. Fla. Nat. 25:38-39.

*Schreiber, E. A., and R. W. Schreiber. 1975. Royal Tern nesting on west-coast peninsular Florida. Fla. Field Nat. 3(2):46-47.

*Robertson, W. B., Jr., and J. A. Kushlan. 1974. The southern Florida avifauna, Pages 414-452 in Gleason, P. J., ed., Environments of south Florida: present and past. Miami Geol. Soc. Memoir 2. 452 pp.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Kilometers

Fig. VIII.D.112. ROYAL TERN (Sterna maxima)

Listed - Species of Special Concern

SANDWICH TERN

Sterna sandvicensis (Latham)

Order Charadriiformes

Family Laridae

Other Names: Cabot's Tern

Distribution: The Sandwich Tern does not breed in the study area, but does occur along the coast during all months of the year. It is accidental inland. The species extends north as a breeder to Virginia and westward in the Gulf of Mexico to Texas and Mexico. A separate race occurs in Europe.

Elimination of the Sandwich Tern from Florida as a breeder occurred late in the 1800's and probably was caused by egging (Robertson and Kushlan 1974). Breeding in the 1800's was at several localities along the peninsular Gulf coast, including Charlotte Harbor, and probably elsewhere in the study area. Breeding in Florida was reestablished in 1970 on an island near Port St. Joe in the panhandle (Stevenson 1972). More recently the species has become a breeder in a Royal Tern colony in the mouth of the St. Johns River in Duval County on the Atlantic coast (R. W. Loftin pers. comm.).

Habitat: The Sandwich Tern is a coastal species. In Florida it nests and rests on sparsely vegetated or barren islands and peninsulas. It forages in bays and offshore in the Gulf. It is more coastal than the Royal Tern, and in the seven-county area it is uncommon in Myakka River State Park (Fla. Dept. Nat. Res. 1976) and even uncommon in the upper reaches of Tampa Bay. It is virtually unknown inland. J. B. Edscorn (unpubl. MS) does not list the species for the Lakeland region in Polk County. In Highlands County, adjacent to the seven-county area on the east, and which now has several active field observers, one recent sighting of the Sandwich Tern was reported

(Woolfenden 1973).

Population Status: The Sandwich Tern is a common coastal resident during the warmer months. By late winter most Sandwich Terns have left the area, and the species becomes uncommon. The species is extremely rare inland at all times. Quantitative data are available for Tampa where an average of five individuals have been seen on the Summer Bird Count, but only an average of one on the winter Christmas Bird Counts (Table VIII.D.11). Number of individuals per 10 party hours and frequency of records parallel this trend. During post-breeding migration, flocks as large as 2000 are seen along the Gulf coast (e.g. 1971-72 Sarasota Christmas Bird Count). The species has been occurring in larger numbers in recent years along the coast of nearby Pinellas County (G. E. Woolfenden pers. comm.) which probably reflects its increase as a breeder nearby. Increased numbers have often preceded establishment of breeding colonies elsewhere.

Basis for Priority Status: The Sandwich Tern is listed as a Species of Special Concern by the Florida Committee on Rare and Endangered Plants and Animals. Suitable nesting habitat is scarce and, because of increased human pressures, becoming scarcer. Even a brief visit by humans to a colony at a critical time in the nesting cycle can cause a great decrease in nesting success of colonial seabirds.

Potential Impacts of Mining: Inland mining activities only would affect Sandwich Terns indirectly by altering the quality of water that flows into bays. Coastal activities that unfavorably altered offshore islands and open beaches would have a more directly deleterious effect on the species through elimination of potential breeding sites.

Selected References:

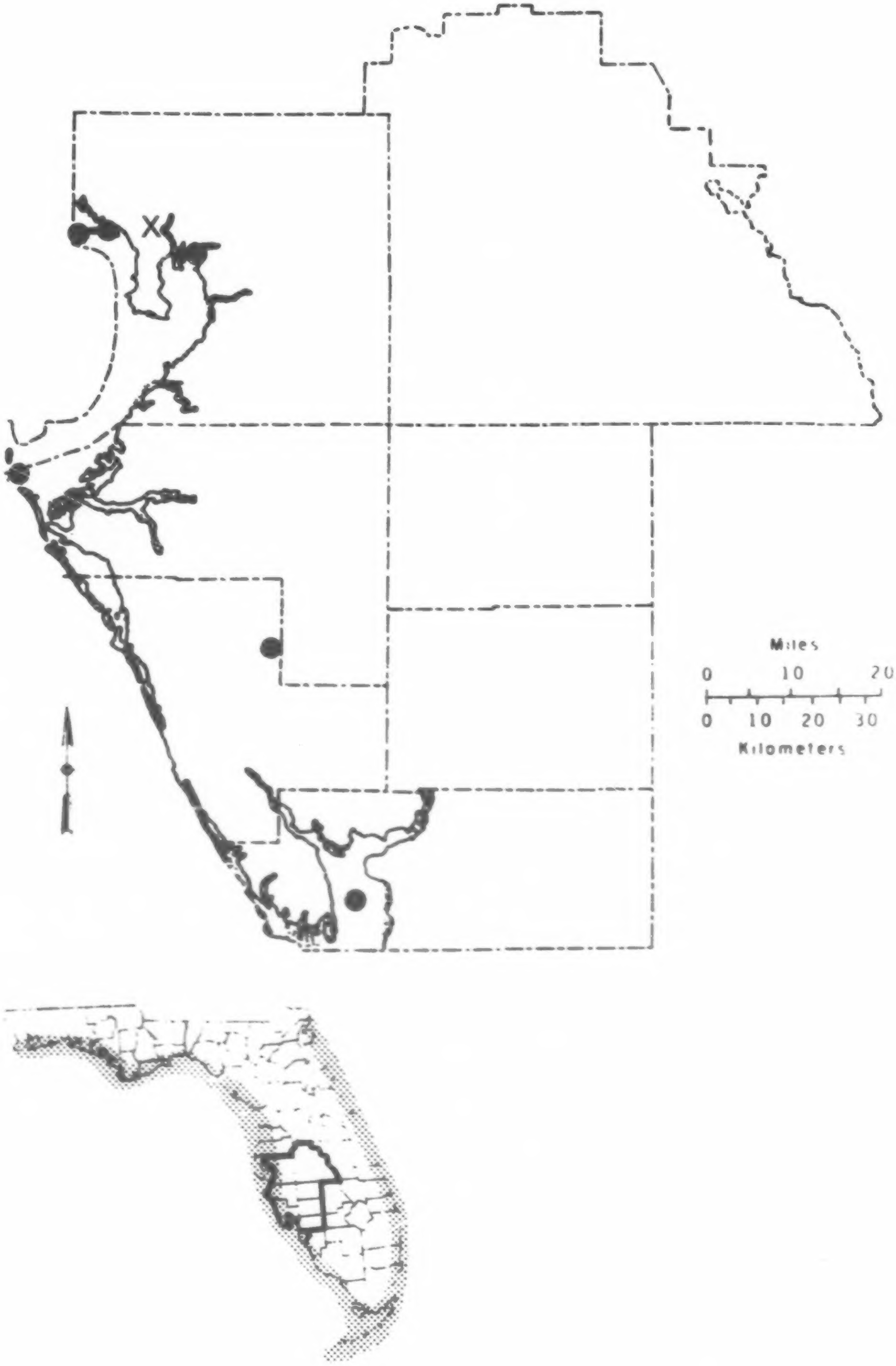
*Edscorn, J. B. Birds of the Lake Region. Unpubl. MS.

*Florida Department of Natural Resources. 1976. Vertebrates of Myakka River State Park. 26 pp.

*Robertson, W. B., Jr., and J. A. Kushlan. 1974. The southern Florida avifauna, Pages 414-452 *in* Gleason, P. J., ed., Environments of south Florida: present and past. Miami Geol. Soc. Memoir 2. 452 pp.

*Stevenson, H. M. 1972. Recent breeding of the Sandwich Tern (*Thalasseus sandvicensis*) in Florida. Fla. Nat. 45(3):94-95.

*Woolfenden, G. E. 1973. Florida region. Am. Birds 27(3):603-607.


Miles
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Kilometers

Fig. VIII.D.113. SANDWICH TERN (Sterna sandvicensis)

Listed- Species of Special Concern

CASPIAN TERN

Sterna caspia (Pallas)

Order Charadriiformes

Family Laridae

Distribution: Records of the Caspian Tern exist for the four coastal counties (Charlotte, Hillsborough, Manatee, Sarasota) and inland from Polk County. Established as a breeder in Florida only as recently as 1962 (Woolfenden and Meyerriecks 1963), most Caspian Terns seen in Florida are winter residents and migrants. In eastern North America the major breeding colonies occur in Texas and Louisiana, North Carolina and Virginia, and around the Great Lakes and Gulf of St. Lawrence. The northern populations winter along the coast from North Carolina and Texas southward (Bystrak 1974). Breeding records for the study area exist for Charlotte and Hillsborough counties.

Habitat: Caspian Terns are less coastal than the similar Royal Tern, and concentrate in estuaries. They also are regular on coastal lakes and rivers. In interior Polk County Edscorn (unpubl. MS) lists the species as a rare and local winter visitor. Nesting is restricted to spoil islands. Establishment as a breeder seems enhanced by the existence of nesting colonies of other terns or gulls (Schreiber 1976).

Population Status: The Caspian Tern is uncommon locally along the coast in the seven-county area and rare inland. In 1974 about 16 pairs nested on Pelican Point, Hillsborough County, and 1 pair nested in Charlotte Harbor, Charlotte County. Unfortunately more recent counts are not available. Despite its establishment within the last 15 years as a breeder in Florida no winter population trends are evident in the seven-county area during the last 11 years (Table VIII.D.6).

Basis for Priority Status: The Caspian Tern is listed as a Species of Special Concern by the Florida Committee on Rare and Endangered Plants and Animals. Its status as a breeder in the seven-county area and elsewhere in Florida is tenuous and depends on the existence of dry, sparsely vegetated estuarine islands with little human disturbance.

Potential Impacts of Mining: Inland mining activities could influence this species only as they might affect the rivers that feed the estuaries where most Caspian Terns forage. Coastal activities related to phosphate could affect its status negatively or positively through destruction or creation, respectively, of sites used for nesting and loafing.

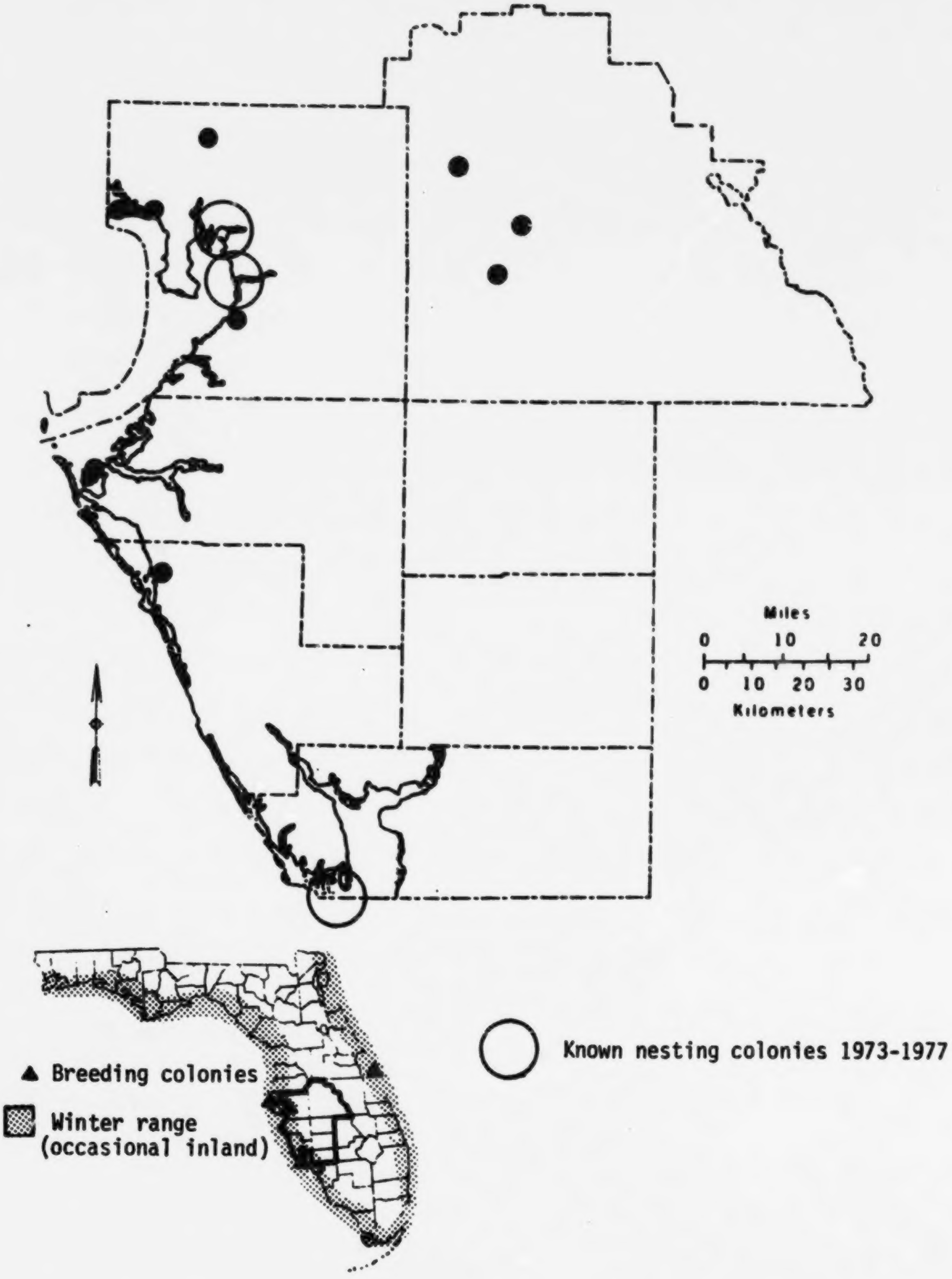
Selected References:

*Bystrak, D. 1974. Wintering areas of bird species potentially hazardous to aircraft. Nat. Aud. Soc. 156 pp.

*Edscorn, J. B. Birds of the Lake Region. Unpubl. MS.

*Schreiber, R. W. 1976. Caspian Tern, Pages 892-894 in Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

*Woolfenden, G. E., and A. J. Meyerriecks. 1963. Caspian Tern breeds in Florida. Auk 80(3):365-366.


Miles
0 10 20
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Kilometers
Known nesting colonies 1973-1977
▲ Breeding colonies
▨ Winter range
(occasional inland)

Fig. VIII.D.114. CASPIAN TERN (Sterna caspia)

Listed - Species of Special Concern

NODDY TERN | *Anous stolidus* (Linnaeus)

Order Charadriiformes | Family Laridae

Other Names: Brown Noddy, Common Noddy

Distribution: Records of the Noddy Tern exist for two counties in the study area: Hillsborough and Sarasota. As with the Sooty Tern, the only breeding colony in the continental United States is at the Dry Tortugas, Monroe County. Noddies also nest on the Yucatan peninsula and at numerous localities in the West Indies. Several races exist, and the species is pantropical (Robertson 1976).

Habitat: Although less pelagic than the Sooty Tern, the Noddy Tern is a sea bird except when nesting. Only remote islands and rocks provide the necessary protection for nesting.

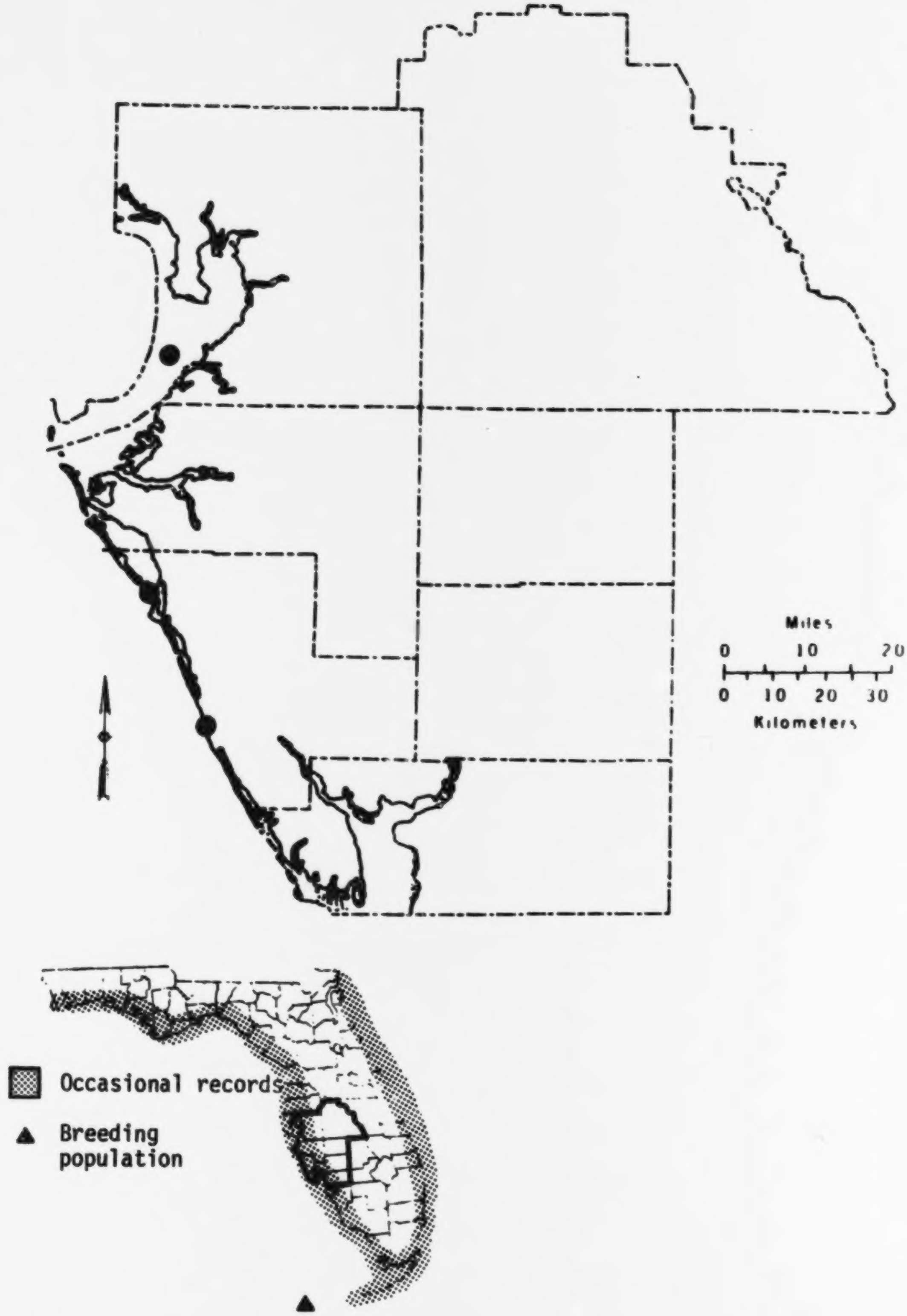
Population Status: Accidental in the study area, a few Noddy Terns occur along the Gulf shores of Florida as waifs after tropical storms.

Basis for Priority Status: Though common in the Dry Tortugas, the Noddy Tern is listed as a Species of Special Concern by the Florida Committee on Rare and Endangered Plants and Animals because it breeds nowhere else in the continental United States.

Potential Impacts of Mining: The species is listed here because a record exists from the seven-county area. There is no reason to suspect that mining and reclamation activities will affect this species.

Selected References:

*Robertson, W. B., Jr. 1976. Noddy Tern, Pages 895-899 in Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.


Miles
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Kilometers
▨ Occasional records
▲ Breeding population

Fig. VIII.D.115. NODDY TERN (Anous stolidus)

Listed - Species of Special Concern

BLACK SKIMMER	Rynchops niger Linnaeus

Order Charadriiformes	Family Rynchopidae

Other Names: Scissorbill, Shearwater

Distribution: Within the study area the Black Skimmer is recorded from the Gulf coast counties (Charlotte, Hillsborough, Manatee, Sarasota) and the Lake Wales Ridge (Polk County), but not from interior low lying DeSoto and Hardee counties. Breeding colonies occur at a few scattered localities on both coasts of Florida, including Hillsborough and Manatee counties, but not in the interior (Barbour 1976, J. B. Edscorn pers. comm.).

Black Skimmers occur along all the coast of Florida and extend north to Massachusetts and west around the Gulf of Mexico. The more northerly populations move south for winter. Winter residents appear to concentrate along the coast of north and central Florida and in Florida Bay (Bystrak 1974).

Habitat: Primarily coastal, Black Skimmers forage in shallow, still waters by knifing the surface with their unique lower bill. Their diet consists almost entirely of small fish. Black Skimmers often are quick to occupy new fills as breeding sites. Though the vegetation must be sparse, Skimmers desert less readily than Least Terns (Sterna albifrons) as new fills or natural beaches advance in successional stages. At the other end of this spectrum are Laughing Gulls (Larus atricilla) which breed in denser vegetation (even beneath trees) than Skimmers. Skimmer colonies often are the sites of breeding by locally rarer species such as Gull-billed, Royal, Sandwich and Caspian terns (F. M. Dunstan, J. Rodgers and R. W. Schreiber pers. comm.;

Woolfenden and Meyerriecks 1963). A lone Laughing Gull was seen nesting in a Skimmer colony (G. E. Woolfenden pers. comm.).

Occurrence inland at fresh water within a few miles of the coast may be for drinking and bathing. Skimmers found regularly farther inland, such as in the Lakeland region (J. B. Edscorn pers. comm.), probably forage in fresh water. The ecology of the sizable populations that occur inland, including in slime ponds, needs study. In recent years Black Skimmers have resorted to nesting on flat gravel roof tops in Florida outside of the study area.

Population Status: Several thousand Skimmers winter each year in the seven-county area. The species is highly social; it rests on beaches and tidal flats, often in large numbers, making possible estimates of total number present over large areas. High counts for the Christmas Bird Counts during recent decades are as follows: Sarasota, 2570 in 1972; Bradenton, 972 in 1960; Lakeland, 520 in 1968; Tampa, 305 in 1976; Venice, 138 in 1976; Lake Wales, 115 in 1970; Myakka River State Park, 68 in 1963. Comparisons of birds per 10 party hours for Black Skimmers (Fig. VIII.D.5) reveal their habitat preferences: Sarasota and Bradenton, with the greatest amount of open Gulf beaches, record the highest averages (and also the highest individual counts). Venice, for reasons unknown, and Tampa with no Gulf beaches and few open bay beaches, average between one-half and one-third as many Skimmers per 10 party hours. The three counts from interior Florida, all with extensive bodies of fresh water, are lowest with one-seventh to one-tenth the number found in Sarasota and Bradenton.

Numbers of Black Skimmers at one locality for different seasons are available only for Tampa (Table VIII.D.11). Though the difference is small, the greater numbers in winter may reflect the influx of migrants from the north.

Barbour (1976) maps nesting colonies for Manatee and Hillsborough counties, but no estimates of colony size are mentioned. The occurrence of many Skimmers during the breeding season inland, where they do not breed, is puzzling. It may be evidence of lack of suitable nesting places.

Basis for Priority Status: The Black Skimmer is listed as a Species of Special Concern by the Florida Committee on Rare and Endangered Plants and Animals. All colonial breeding birds that nest on open beaches have difficulty breeding successfully because their habitat, which was limited under natural conditions, is being further decreased through human alteration. Furthermore, those open beaches that have not been eliminated are being subjected to more frequent disturbance [illegible] humans.

Potential Impacts of Mining: Mining activities probably would have no significant impact on this species. Reduction of water quality of lakes and rivers where the species occurs inland could be detrimental, and the same is true in regard to estuaries where coastal populations and their open beach and island nesting sites occur. An increase in extensive slime ponds inland might result in establishment of more interior colonies.

Selected References:

*Barbour, D. B. 1976. Black Skimmer, Pages 900-903 in Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

*Bystrak, D. 1974. Wintering areas of bird species potentially hazardous to aircraft. Nat. Aud. Soc. 156 pp.

*Woolfenden, G. E., and A. J. Meyerriecks. 1963. Caspian Tern breeds in Florida. Auk 80(3):365-366.

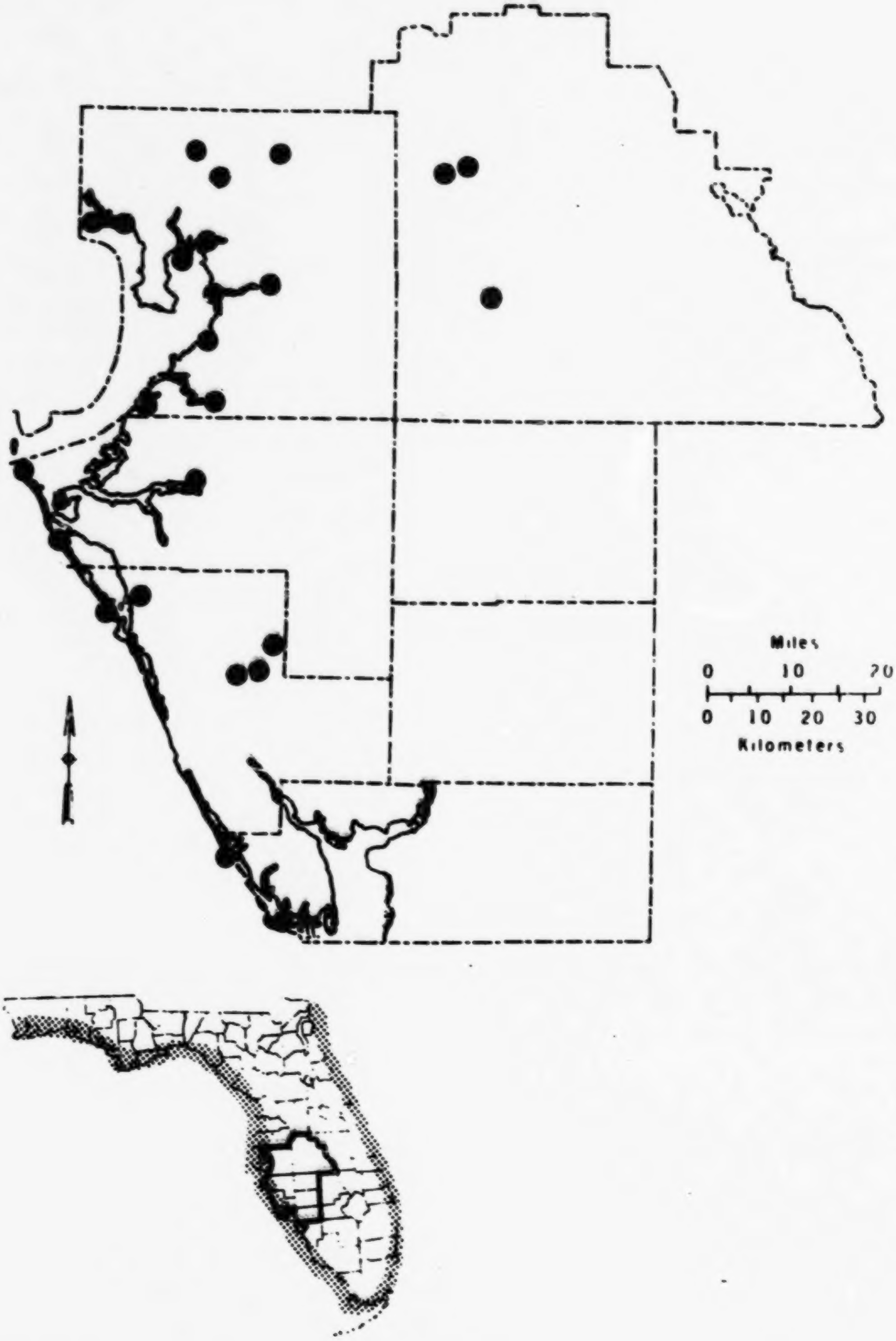
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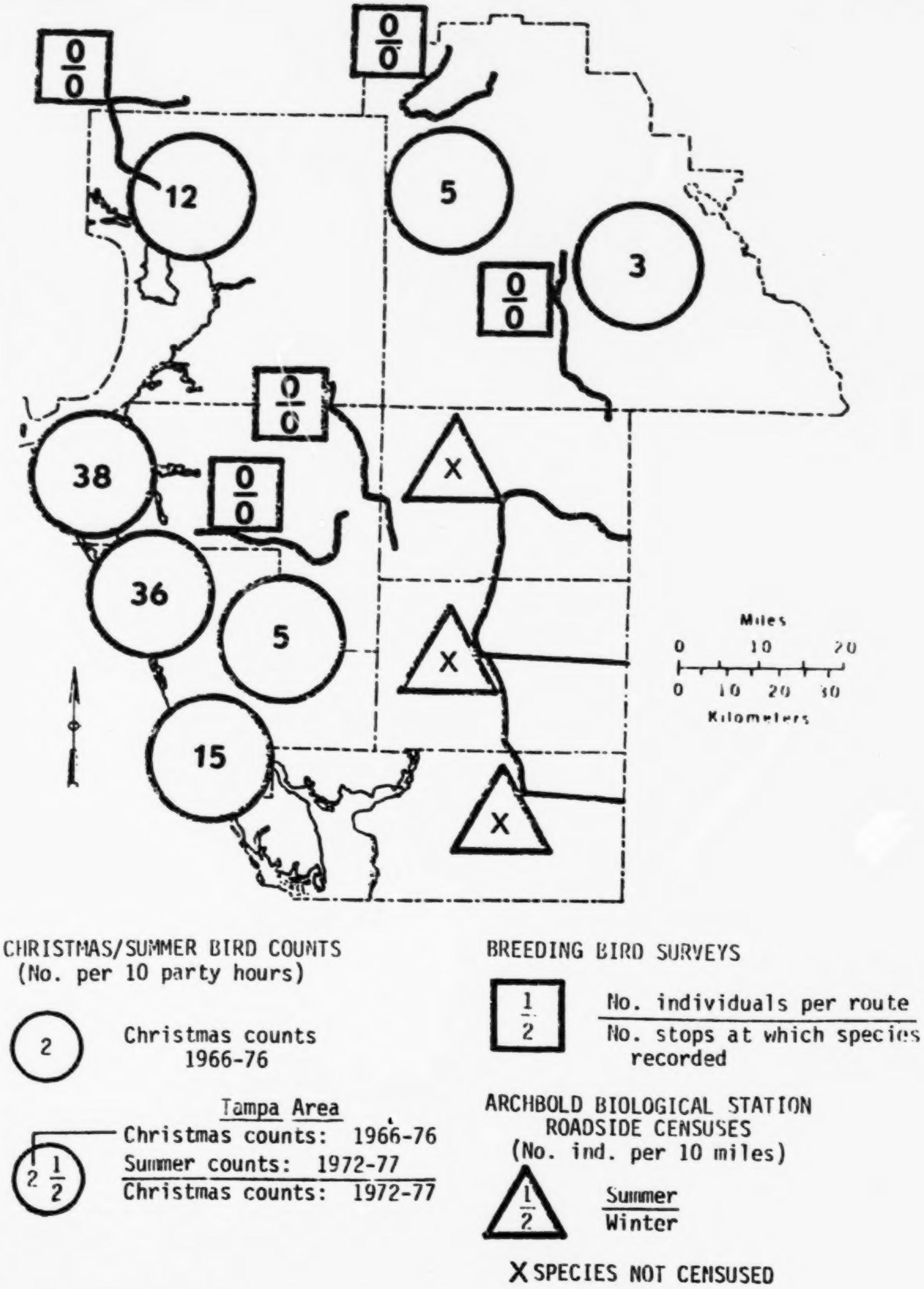
Fig. VIII.D.116. BLACK SKIMMER (Rynchops niger)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12
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3
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38
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X
36
5
X
15
X
Miles
0 10 20
0 10 20 30
Kilometers
CHRISTMAS/SUMMER BIRD COUNTS
(No. per 10 party hours)
2
Christmas counts 1966-76
Tampa Area
Christmas counts: 1966-76
Summer counts: 1972-77
Christmas counts: 1972-77
2 1/2
BREEDING BIRD SURVEYS
1/2
No. individuals per route
No. stops at which species recorded
ARCHBOLD BIOLOGICAL STATION ROADSIDE CENSUSES
(No. ind. per 10 miles)
1/2
Summer
Winter
X SPECIES NOT CENSUSED

Fig. VIII.D.117. BLACK SKIMMER (Rynchops niger). Population data.

Game

WHITE-WINGED DOVE *Zenaida* *asiatica* (Linnaeus)

Order Columbiformes Family Columbidae

Distribution: Within the seven-county area, White-winged Doves have been reported from Anna Maria, Manatee County, in 1958 (Stevenson 1959) and Sarasota, Sarasota County, on several occasions from 1960 (Stevenson 1960) through 1973 (Kale 1973).

Possibly the White-winged Dove was of casual natural occurrence in central and southern Florida in earlier years (Howell 1932). However, the natural status of the species is now obscured by introductions from other countries (Fisk 1968) and intrastate relocation programs (Brady 1976). An early introduction occurred at Homestead, Dade County in 1959; the population there has increased and spread (Fisk 1968, Ogden 1974). A recent relocation carried out by the Florida Game and Fresh Water Fish Commission was of eight adults trapped in Homestead and released in the citrus area of Highlands County (Brady 1976), adjacent to the study area.

The natural range of the species includes southwestern United States and extends into South America and the Bahamas to the Greater Antilles.

Habitat: A bird of open habitats where it is native, the Florida birds are found mostly in groves and suburbs.

Population Status: The Homestead population was about 200 birds in 1968 (Fisk 1968). According to Ogden (1973, 1974) this population continues to expand.

Basis for Priority Status: With little regard for possible impacts on native wildlife, the species is being propagated and intentionally spread in Florida in hopes that it will become established in numbers sufficient for hunting.

Potential Impacts of Mining: Though base line data are lacking, it seems safe to assume that mining would have no effect on White-winged Doves in the seven-county area. Several types of reclaimed land would probably provide suitable habitats for this species.

Selected References:

*Brady, J. R. 1976. White-winged Dove relocation experiment, Job No. XVII-A-1 in Florida Game and Fresh Water Fish Commission Job Performance Rept. W-41-23.

*Fisk, E. J. 1968. White-winged Doves breeding in Florida. Fla. Nat. 41(3):126.

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

*Kale, H. W., II. 1973. Florida region. Am. Birds 27(4):761-765.

*Ogden, J. C. 1973. Florida region. Am. Birds 27(5):859-863.

*Ogden, J. C. 1974. Florida region. Am. Birds 28(5):892-896.

*Stevenson, H. M. 1959. Florida region. Aud. Field Notes 13(3): 285-289.

*Stevenson, H. M. 1960. Florida region. Aud. Field Notes 14(3): 301-305.

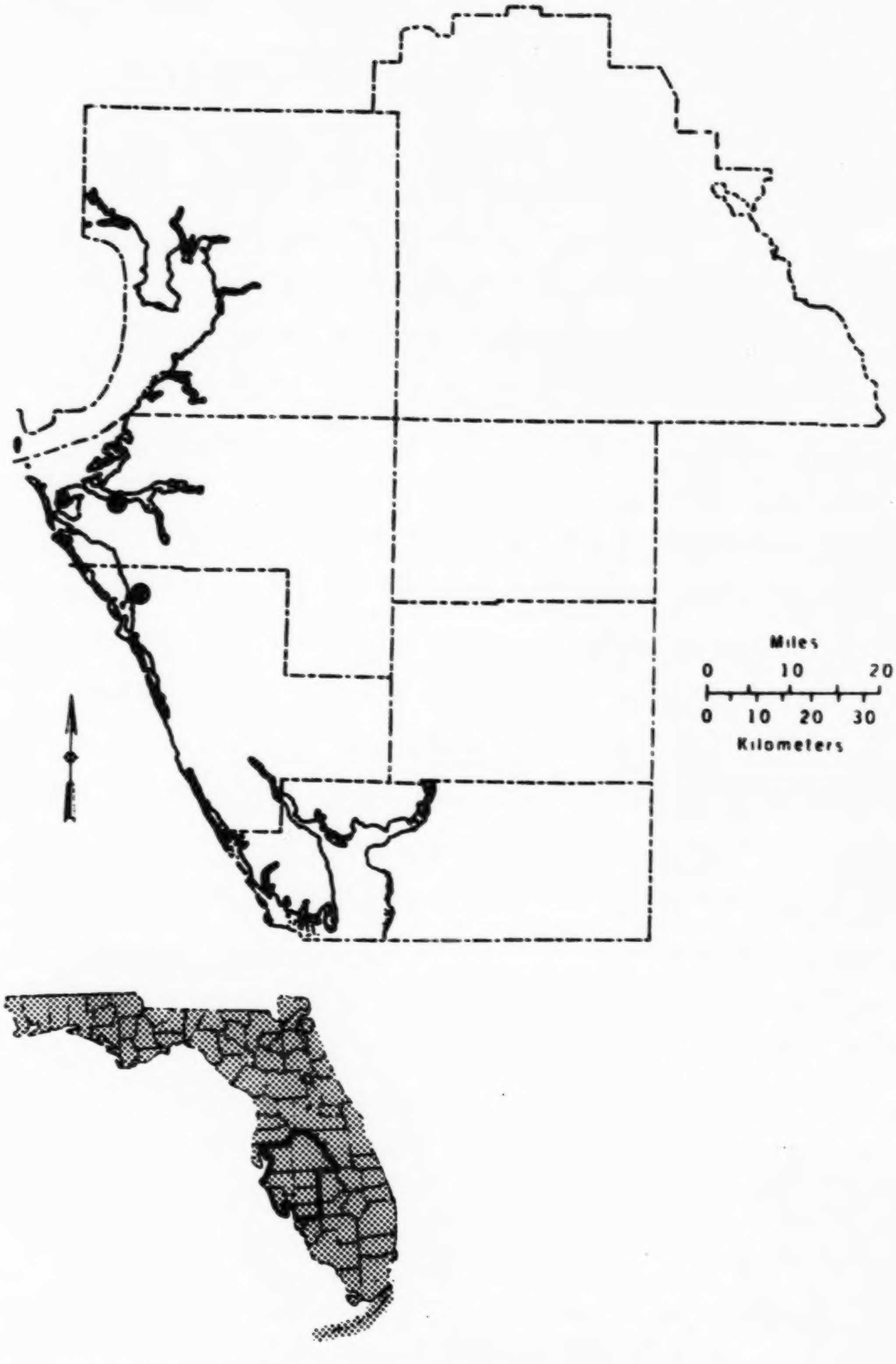
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Fig. VIII.D.118. WHITE-WINGED DOVE (Zenaida asiatica)

Game

MOURNING DOVE *Zenaida macroura* (Linnaeus)

Order Columbiformes Family Columbidae

Distribution: One of the most widespread birds in North America, the Mourning Dove is a permanent resident and generally distributed throughout the study area and the remainder of Florida. The species extends northward throughout conterminous United States and southern Canada, and is migratory only in a portion of the northern half of its range (Robbins *et al*. 1966).

Habitat: In Florida, Mourning Doves inhabit pine forest and forest edge. They have moved into suburban habitats of pine, landscape plantings, and groves, apparently especially along the coast (Robertson and Kushlan 1974).

Population Status: The Mourning Dove is a common permanent resident throughout the study area. It is locally abundant in suburbs, especially near the coast (Fig. VIII.D.5). Breeding densities for natural habitats in Florida that Mourning Doves use reach 5 to 12 pairs per 100 acres (Woolfenden 1969, Woolfenden and Rohwer 1969a). Breeding densities in suburbs, both in Florida and other states, are several times greater. In Pinellas County, adjacent to the study area,densities in mature suburbs in St. Petersburg were 103 to 150 pairs per hundred acres. In a relatively new suburb with fewer and smaller trees the density was only 23 pairs per 100 acres, which still is two to five times greater than in natural habitats.

Strip censuses conducted in Bradenton, Manatee County, show densities comparable to those in St. Petersburg (26.1 versus 25.9 doves per mile), while the results for Tampa, Hillsborough County (13.3 doves per mile), are lower, supporting the statement that in the seven-county area suburban dove densities are highest near the coast. Reasons for this difference are unknown

(Woolfenden and Rohwer 1969b).

A general decline in the Florida population of Mourning Doves claimed by Halls and Stransky (1971) is supported by the Christmas Bird Count data from the seven-county area during the years 1966-1976 (Table VIII.D.6). According to Halls and Stransky (1971), a general decline began in the late 1930's, with a further increase in the decline more recently. Causes for the decline remain unknown. The population in Florida in winter, when migrants and fledglings increase the total number of doves present, was estimated to be 41 million in the early 1970's.

Basis for Priority Status: The Mourning Dove is a game species. Based on number of individuals killed and number of hunters pursuing it, it ranks as the most important game animal in Florida. Although harvest data are not available for the seven-county area, the 1975-76 estimated season harvest of doves in the South Region, of which the study area is a part, was 761,295, or about 28 percent of the total (2,740,570) for the entire state (Conklin 1977). Minimum annual estimates of the harvest in Florida in earlier years (1964-1969) ranged from about 367,571 to 482,112 (MacDonald and Martin 1971).

Potential Impacts of Mining: The Mourning Dove is widespread and common. Mining activities that result in eliminating forests, draining wetlands, and increases in drier, open areas would probably increase Mourning Dove populations. Reclamation could be designed to produce lands that could probably be relatively easily managed to provide excellent dove hunting.

Selected References:

*Conklin, E. J. 1977. Wildlife inventory, harvest and economic survey. Fla. Game and Fresh Water Fish Comm. Job Performance Rept. 1-A-1. 2 pp.

*Halls, L. K., and J. J. Stransky. 1971. Atlas of southern forest game. Southern Forest Exp. Station. 24 pp.

*MacDonald, D., and E. Martin, compilers. 1971. Trends in harvest of migratory game birds other than waterfowl 1964-65 to 1968-69. Bur. of Sport Fisheries and Wildl. Spec. Sci. Rept. - Wildl. No. 142, Washington, D. C. 29 pp.

*Robbins, C. S., B. Bruun, and H. S. Zim. 1966. Birds of North America. Golden Press, New York. 340 pp.

*Robertson, W. B., Jr., and J. A. Kushlan. 1974. The southern Florida avifauna, Pages 414-452 in Gleason, P. J., ed., Environments of south Florida: present and past. Miami Geol. Soc. Memoir 2. 452 pp.

*Woolfenden, G. E. 1969. Breeding-bird censuses of five habitats at Archbold Biological Station. Aud. Field Notes 23(6):732-738.

*Woolfenden, G. E., and S. A. Rohwer. 1969a. Breeding birds in a Florida suburb. Bull. Fla. State Mus. 13(1):1-83.

*Woolfenden, G. E., and S. A. Rohwer. 1969b. Relative abundance of bird populations in residential districts of the Tampa Bay area. Fla. State Brd. of Health Monogr., No. 12:110-117.

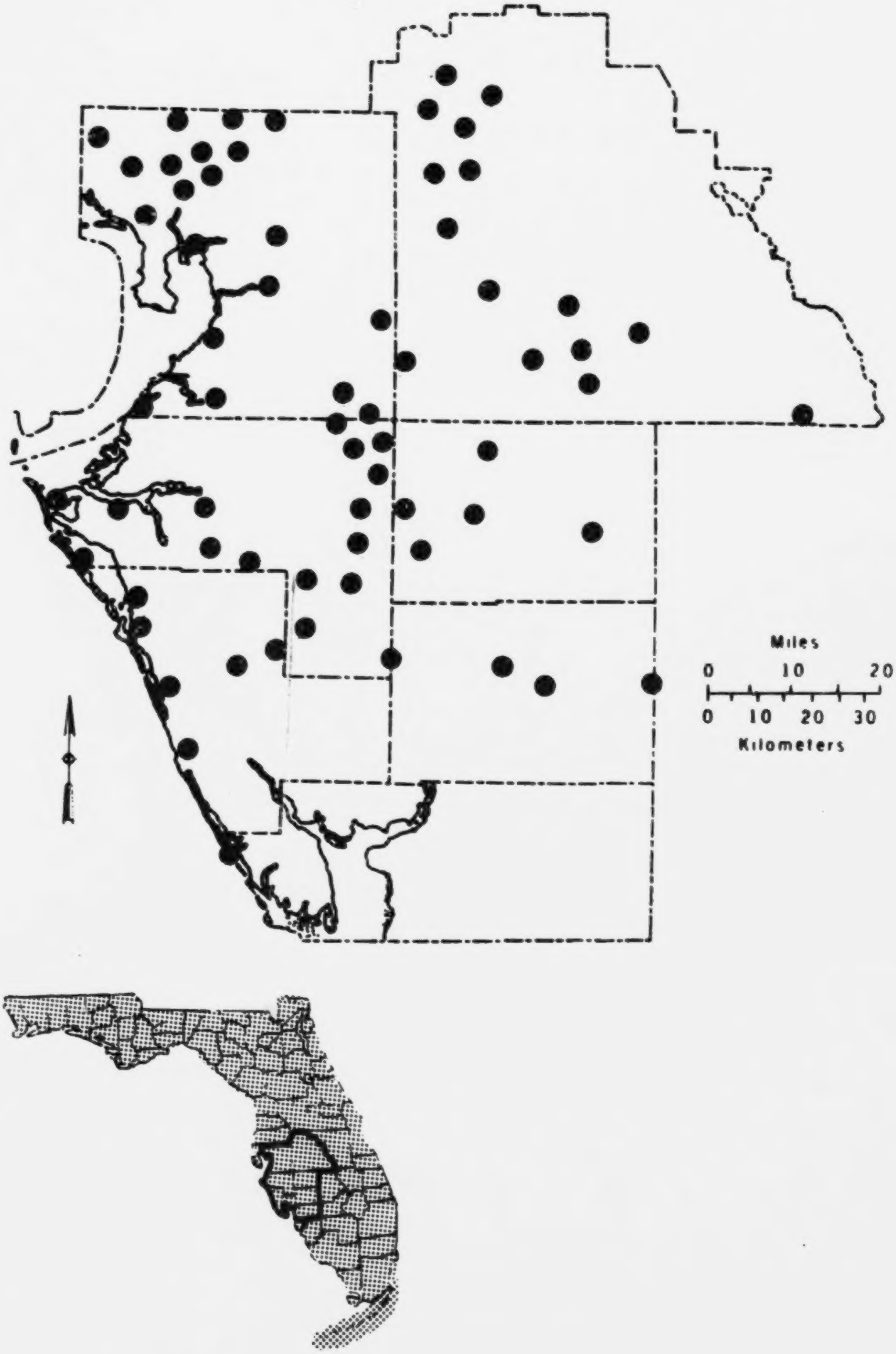
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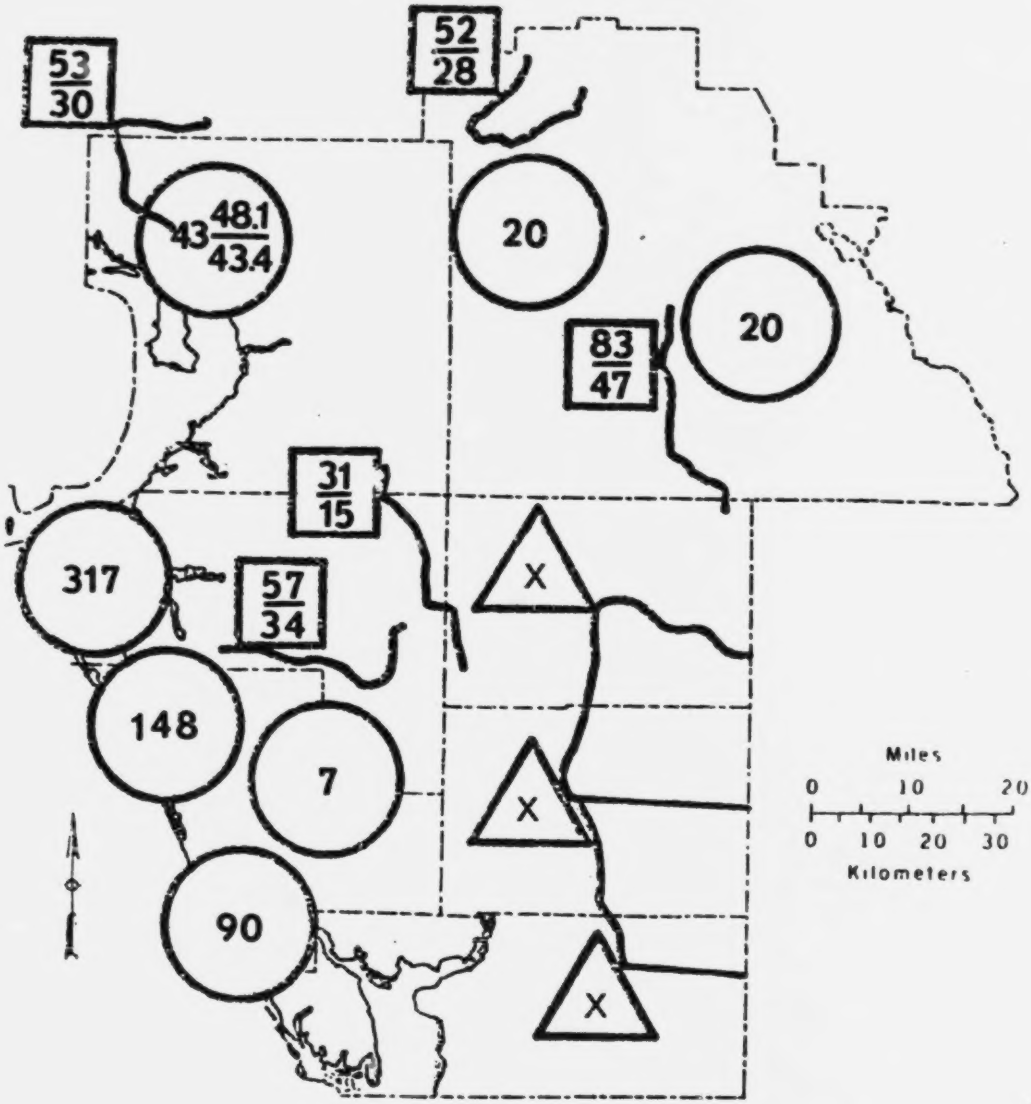
Fig. VIII.D.119. MOURNING DOVE (Zenaida macrcura)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52/28
43 48.1/43.4
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20
83/47
31/15
317
57/34
X
148
7
X
90
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Miles
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Kilometers

CHRISTMAS/SUMMER BIRD COUNTS
(No. per 10 party hours)

2 Christmas counts 1966-76

Tampa Area

2 1/2 Christmas counts: 1966-76

Summer counts: 1972-77 / Christmas counts: 1972-77

BREEDING BIRD SURVEYS

1/2 No. individuals per route / No. stops at which species recorded

ARCHBOLD BIOLOGICAL STATION
ROADSIDE CENSUSES
(No. ind. per 10 miles)

1/2 Summer / Winter

X SPECIES NOT CENSUSED

Fig. VIII.D.120. MOURNING DOVE (*Zenaida macroura*). Population data.

Listed - Threatened, Rare

MANGROVE CUCKOO | *Coccyzus minor* (Gmelin)

Order Cuculiformes | Family Cuculidae

Other Names: Black-eared Cuckoo, Rain Bird, Rain Crow

Distribution: In the seven-county area, records of this species exist from all four coastal counties (Charlotte, Hillsborough, Manatee, Sarasota), and Edscorn (unpubl. MS) places it on the hypothetical list for the Lake Region, Polk County. The Mangrove Cuckoo is a summer resident in southern Florida, breeding, and sometimes wintering, chiefly on the Keys and islands off the west coast north to Pinellas County. The species also is found from western Mexico and the Bahama Islands south to northern South America.

Habitat: At present the Mangrove Cuckoo is confined almost exclusively to mangrove swamps, but sometimes is found in coastal scrub, closed hardwood forests or forest edge communities. Outside of the United States the species occurs in a greater variety of forest habitats, and it is giving an indication of habitat expansion in southern Florida (Robertson and Kushlan 1974).

Population Status: The Mangrove Cuckoo is rare in the seven-county area and difficult to census because of its retiring habits (Robertson 1976). Extensive land development along the Florida coast has eliminated much of the species' habitat, but numerous winter records and casual reports farther north and inland in south Florida suggest that the Mangrove Cuckoo, which perhaps formerly was present only in summer, may be expanding its Florida range (Robertson 1976; Robertson and Kushlan 1974).

Basis for Priority Status: Because of its rarity and habitat specificity, which makes it particularly vulnerable to coastal development, the Mangrove Cuckoo has been designated as Threatened by the Florida Game and Fresh Water Fish Commission and Rare by the Florida Committee on Rare and Endangered Plants and Animals.

Potential Impacts of Mining: This species would be affected by mining only to the degree that mangrove swamps are altered as a secondary result of mining operations, such as construction of processing plants or additional shipping facilities.

Selected References:

Bent, A. C. 1940. Life histories of North American cuckoos, goatsuckers, hummingbirds, and their allies. U. S. Nat. Mus. Bull. 176.

*Edscorn, J. B. Birds of the Lake Region. Unpubl. MS.

*Robertson, W. B. 1976. Mangrove Cuckoo, Pages 823-827 *in* Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

*Robertson, W. B., Jr., and J. A. Kushlan. 1974. The southern Florida avifauna, Pages 414-452 *in* Gleason, P. J., ed., Environments of south Florida: present and past. Miami Geol. Soc. Memoir 2. 452 pp.

Stimson, L. A. 1964. Mangrove Cuckoo in deciduous woods. Fla. Nat. 37:25.

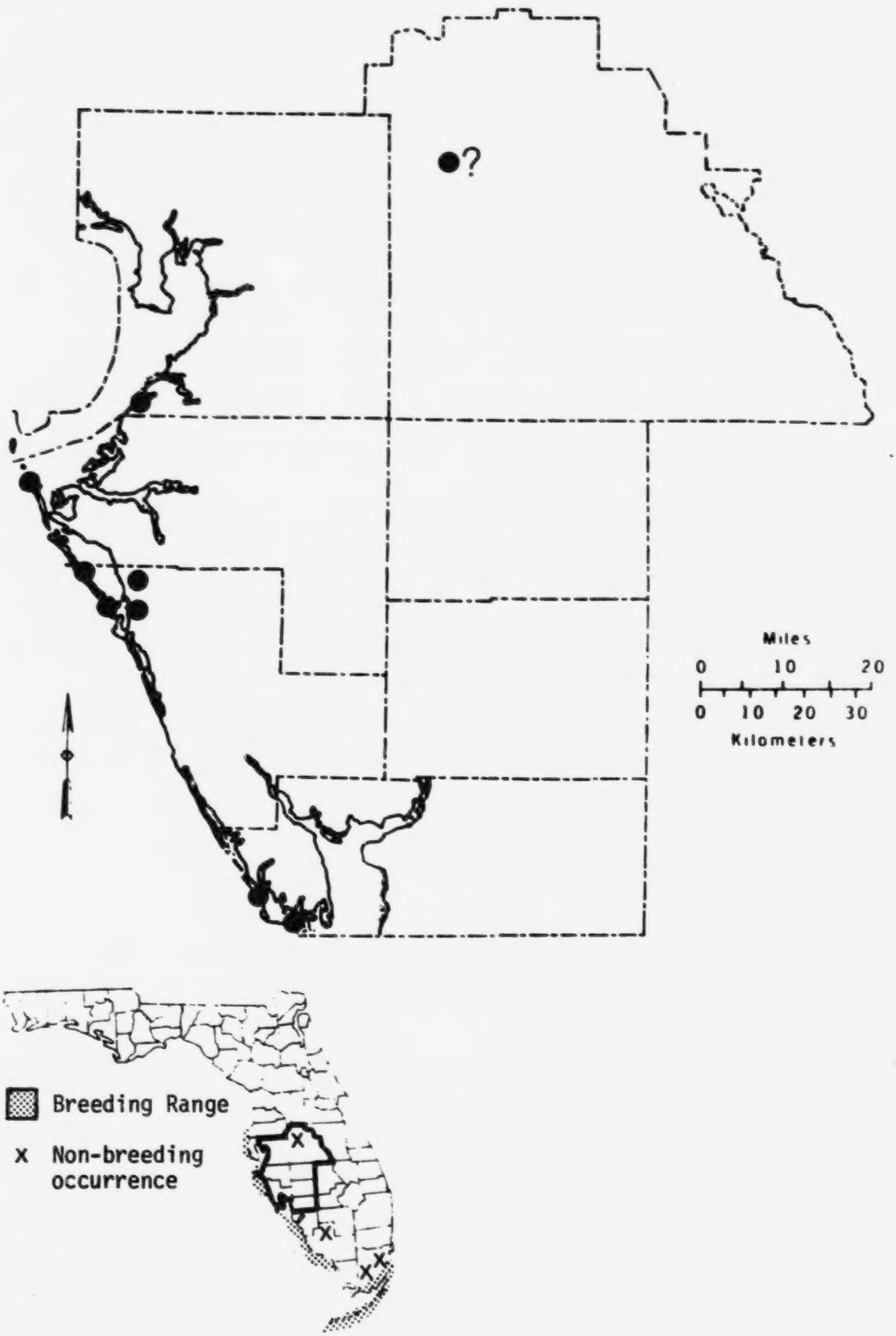
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Fig. VIII.D.121. MANGROVE CUCKOO (*Coccyzus minor*)

Listed - Blue List

YELLOW-BILLED CUCKOO — *Coccyzus americanus* (Linnaeus)

Order Cuculiformes — Family Cuculidae

Distribution: The Yellow-billed Cuckoo is recorded from all seven counties in the study area. It is a summer resident and breeder throughout Florida. It appears in April and departs by November. Outside of Florida the Yellow-billed Cuckoo breeds from southern Canada south to Baja California and the Gulf coast and winters in South America. Known nesting locations within the seven-county area include Hillsborough River State Park (Stevenson 1967), Myakka River State Park (K. C. Alvarez pers. comm.), and Orange Park, Polk County (J. B. Funderburg pers. comm.).

Habitat: Less restricted in habitat than the Mangrove Cuckoo, the Yellow-billed Cuckoo is a broad-leaf forest bird, inhabiting mixed hardwood swamps, cypress swamps, live oak hammocks, and forest edge in the study area.

Population Status: The Yellow-billed Cuckoo is a common bird in areas of suitable habitat. A density of 6 pairs per 100 acres was estimated for a plot in a live oak-cabbage palm hammock in Hillsborough River State Park (Woolfenden 1967). Similar densities have been estimated for wooded habitats in Florida but outside of the study area. In a similar habitat in Indian River County, Kale and Webber (1968) estimated 6.8 pairs per 100 acres, and in coastal hammock scrub and an abandoned grove in southern Florida, Robertson (1955) estimated densities of 4.5 and 7 pairs per 100 acres, respectively. In wet maple swamp and mixed oak ridge habitat in Pinellas County, densities were higher, with an estimated 20 pairs per 100 acres (Rohwer and Woolfenden 1969).

Basis for Priority Status: This species is listed on the 1977 Blue List of the National Audubon Society. Its populations are showing decline in some parts of its range but not in others.

Potential Impacts of Mining: Further knowledge of the population status, life history and ecology of this species in the seven-county area is needed before potential mining impacts can be assessed with confidence. However, it seems a safe assumption that elimination of forest areas in mining will reduce the region's carrying capacity for this species. Even if wooded areas are reestablished on reclaimed lands, it would be many years before they reached a stage suitable for cuckoos.

Selected References:

*Kale, H. W., II, and L. A. Webber. 1968. Oak-palm-hickory hammock and maple swamp. Aud. Field Notes 22(6):680-684.

*Robertson, W. B., Jr. 1955. An analysis of the breeding-bird populations of tropical Florida in relation to the vegetation. Ph.D. Thesis. Univ. of Illinois, Urbana.

*Rohwer, S. A., and G. E. Woolfenden. 1969. Breeding birds of two Florida woodlands: comparisons with areas north of Florida. Condor 71:38-48.

Sprunt, A., Jr. 1954. Florida bird life. Coward-McCann, Inc., New York. 527 pp.

*Stevenson, J. A. 1967. A list of the vertebrates identified in Hillsborough River State Park. Fla. Brd. of Parks. 16 pp.

*Woolfenden, G. E. 1967. Live oak-cabbage palm hammock (Breeding bird census). Aud. Field Notes 21(6):635-637.

Woolfenden, G. E. 1968. Live oak-cabbage palm coastal hammock (Breeding bird census). Aud. Field Notes 22(6):676-680.

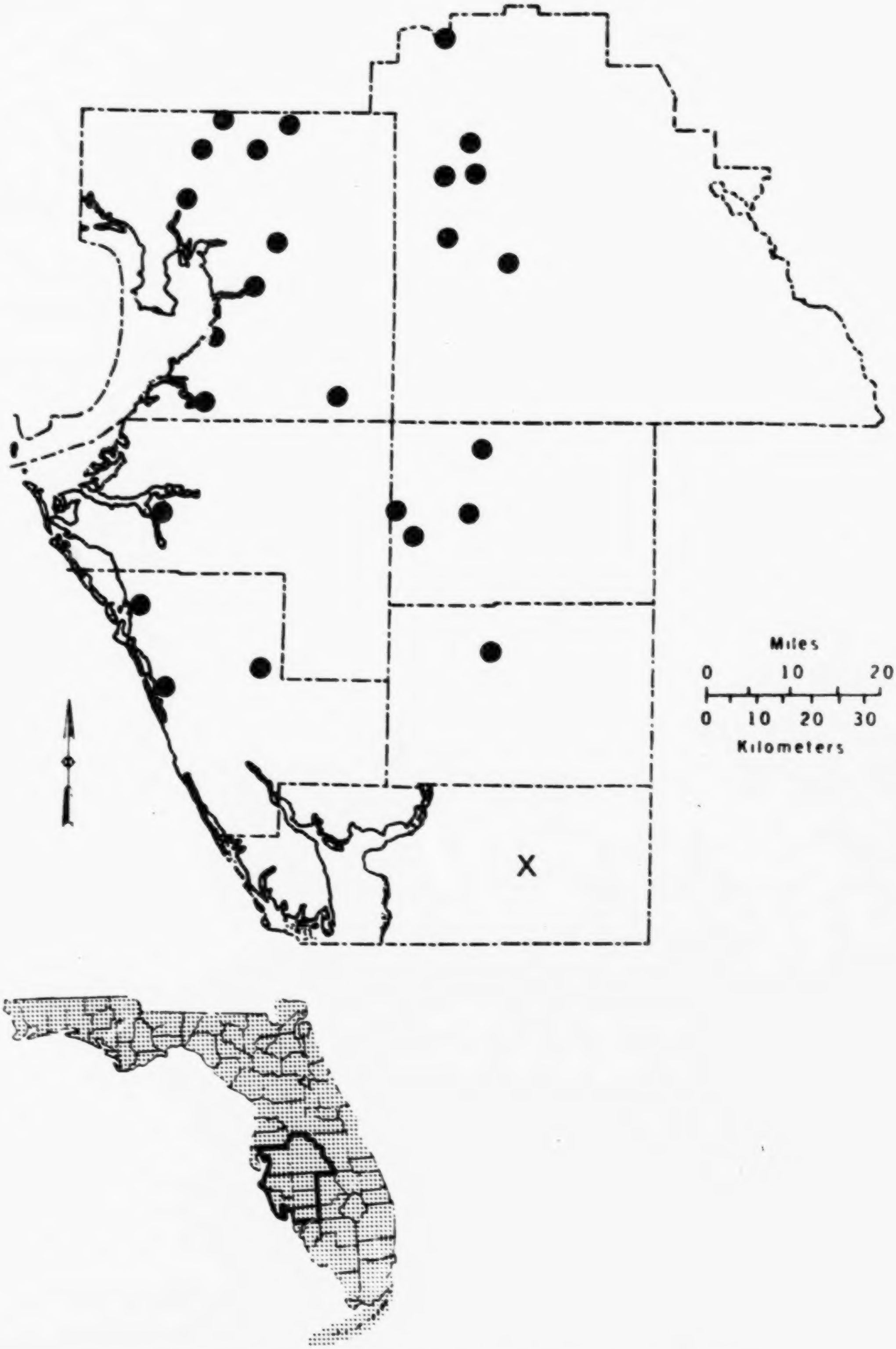
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Fig. VIII.D.122. YELLOW-BILLED CUCKOO (*Coccyzus americanus*)

Listed - Blue List

BARN OWL — *Tyto alba* (Scopoli)

Order Strigiformes — Family Tytonidae

Distribution: The Barn Owl is recorded from all seven counties in the study area. It is a permanent resident throughout mainland Florida. Though it may not nest on the Keys, it does occur there in winter. Almost cosmopolitan in its range, the Barn Owl breeds throughout most of the United States south to eastern Guatemala. Northern populations migrate, although details are lacking for this secretive animal.

Habitat: Barn Owls frequent developed areas, from small towns to large cities, as well as open country such as pastures, marshes, old fields, and phosphate reclamation areas (F. Montalbano pers. comm.) within the seven-county area. The species has been reported nesting in old buildings at Bartow, Polk County, and Seddon Island, Tampa, Hillsborough County (G. E. Woolfenden pers. comm.), in steeples at Mountain Lake Sanctuary near Lake Wales, Polk County (Morrison 1964, 1971), in cavities of large trees in Hillsborough River State Park (Woolfenden 1967, 1968), and in barns at Piney Point, Manatee County (G. E. Woolfenden pers. comm.).

Population Status: Because Barn Owls are nocturnal and rarely seen, quantitative estimates of their abundance are difficult. Although the species is uncommon in Florida, it is found regularly in habitats that offer both suitable roosting and foraging sites. Of the Christmas Bird Counts in the seven-county area, they have been seen most often on the Lakeland count, in which two to four have been recorded in every year except two since 1966.

Basis for Priority Status: The Barn Owl is included on the 1977 Blue List of the National Audubon Society because its numbers appear to be declining throughout the range.

Potential Impacts of Mining: Field studies of areas proposed for mining or other disturbances should consider that Barn Owls exploit a variety of habitat types for foraging and roosting and that the species, or signs of its presence, may be easily overlooked. Considering the broad habitat preferences of this species and the versatility of its nesting requirements, mining is unlikely to have any significant impact on its status. Unreclaimed mined lands and various types of reclaimed habitats would be suitable for this species.

Selected References:

*Morrison, K. D. 1964. Lake Wales area. Fla. Nat. 37(3):83.

*Morrison, K. D. 1971. Lake Wales area. Fla. Nat. 44(2):54.

*Woolfenden, G. E. 1967. Live oak-cabbage palm hammock (Breeding bird census). Aud. Field Notes 21(6):635-637.

*Woolfenden, G. E. 1968. Live oak-cabbage palm hammock (Winter bird population study). Aud. Field Notes 22(3):488.

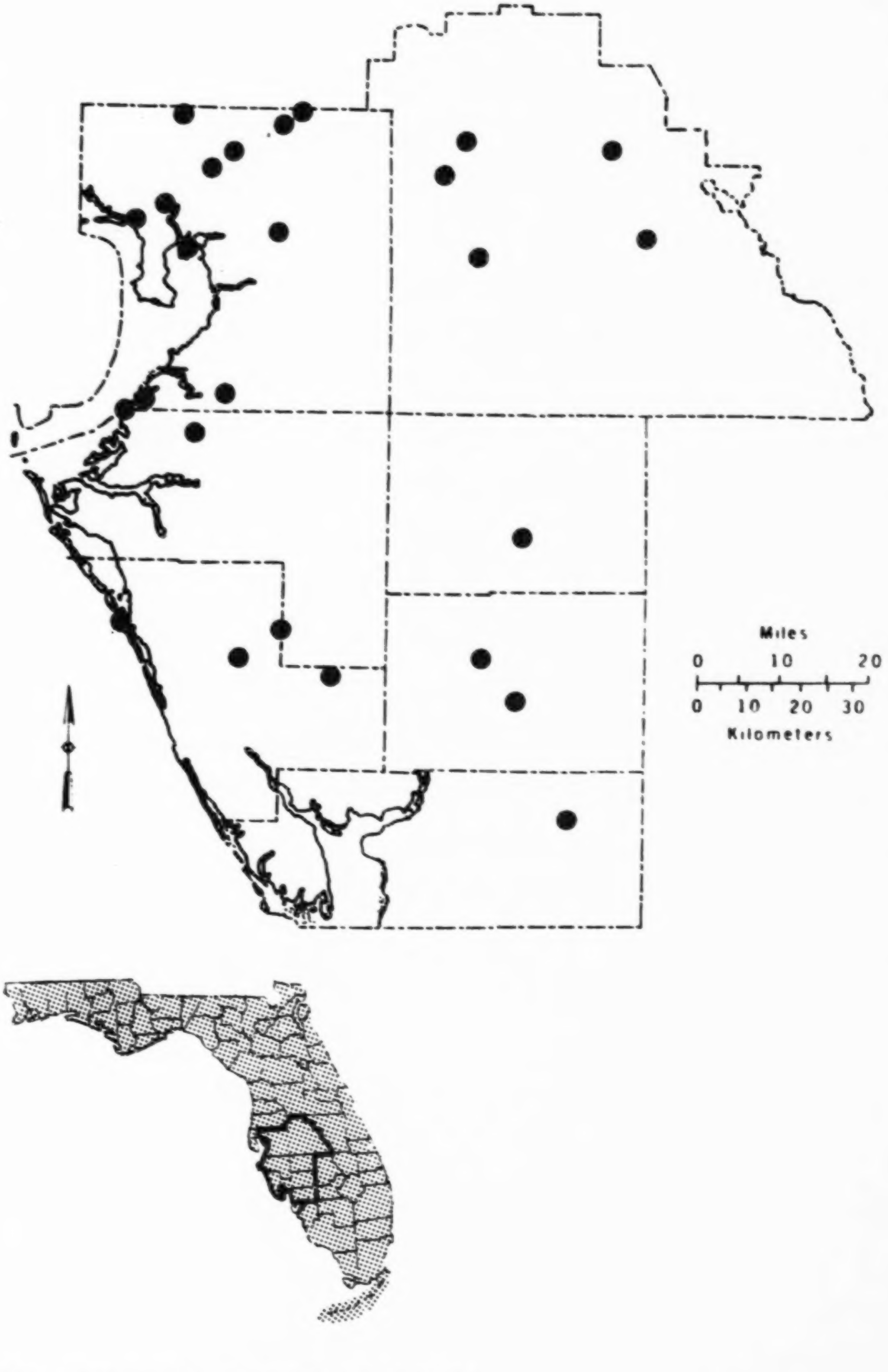
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Fig. VIII.D.123. BARN OWL (Tyto alba)

Biologically Significant

SCREECH OWL | *Otus asio* (Linnaeus)

Order Strigiformes | Family Strigidae

Distribution: Although no actual records are available from Charlotte County, the Screech Owl is undoubtedly a resident breeder throughout the seven-county area. It occurs in all parts of Florida, including the Keys. Its range extends from southeastern Alaska and extreme southern Canada south through the continental United States to southern Mexico.

Habitat: The Screech Owl is primarily a woodland species. Its habitats in the seven-county area include pine flatwoods, hammocks, plantations, parklands, and developed areas. It is a hole-nester, using cavities in trees or man-made structures for nest sites. It readily adapts to artificial nest boxes.

Population Status: Although abundant in Florida, Screech Owls are difficult to census accurately. Thus, numbers recorded on Christmas Bird Counts and other censuses are not indicative of population levels, unless special attempts are made to census owls. For example, typical numbers recorded on Christmas Bird Counts in the seven-county area range from 0 to 4, but on the 1973-74 Tampa Christmas Bird Count, which included pre-dawn censusing using tape-recorded Screech Owl calls to elicit responses, 73 Screech Owls were recorded. Few estimates of population density of the species exist for any part of its range. Cink's (1975) study at four sites in northeastern Kansas showed densities ranging from 0.08 to 0.56 owls per square mile, with the higher values recorded from areas with a greater percentage of woodland. At the Archbold Biological Station in Highlands County adjacent to the seven-county area on the east, 12 to 18 females regularly nest each spring in nest boxes distributed over 1000 acres of woodland habitat (F. E. Lohrer pers. comm.). In Pinellas County on the northwestern border of the seven-county area, Rohwer and Woolfenden (1969) found two pairs nesting on a 30-acre mixed oak ridge.

Basis for Priority Status: While all owls are biologically interesting as raptorial birds, the Screech Owl is of further biological significance in that it exhibits an interesting polymorphism of color and pattern throughout eastern North America. About one-fourth of the northern population has a rufous plumage while others are mainly gray. Plumages intermediate in coloration to the rufous and gray plumages are rare in most of eastern North America except in Florida and the adjacent Gulf coast, where intermediately-colored birds comprise up to 40 percent of the population (Owen 1963). As a "top carnivore", the Screech Owl makes a useful indicator of environmental conditions.

Potential Impacts of Mining: The clearing of wooded areas in mining would reduce Screech Owl habitat and thus presumably result in an overall reduction in the population of the seven-county area. Most of the types of environments now created by reclamation would not be suitable. Types planted with trees would require a long period of time before providing suitable habitat conditions for this species.

Selected References:

*Cink, L. C. 1975. Population densities of Screech Owls in northeastern Kansas. Kansas Ornith. Soc. Bull. 26(3):13-16.

*Owen, D. F. 1963. Polymorphism in the Screech Owl in eastern North America. Wilson Bull. 75(2):183-190.

*Rohwer, S. A., and G. E. Woolfenden. 1969. Breeding birds of two Florida woodlands: comparisons with areas north of Florida. Condor 71(1):38-48.

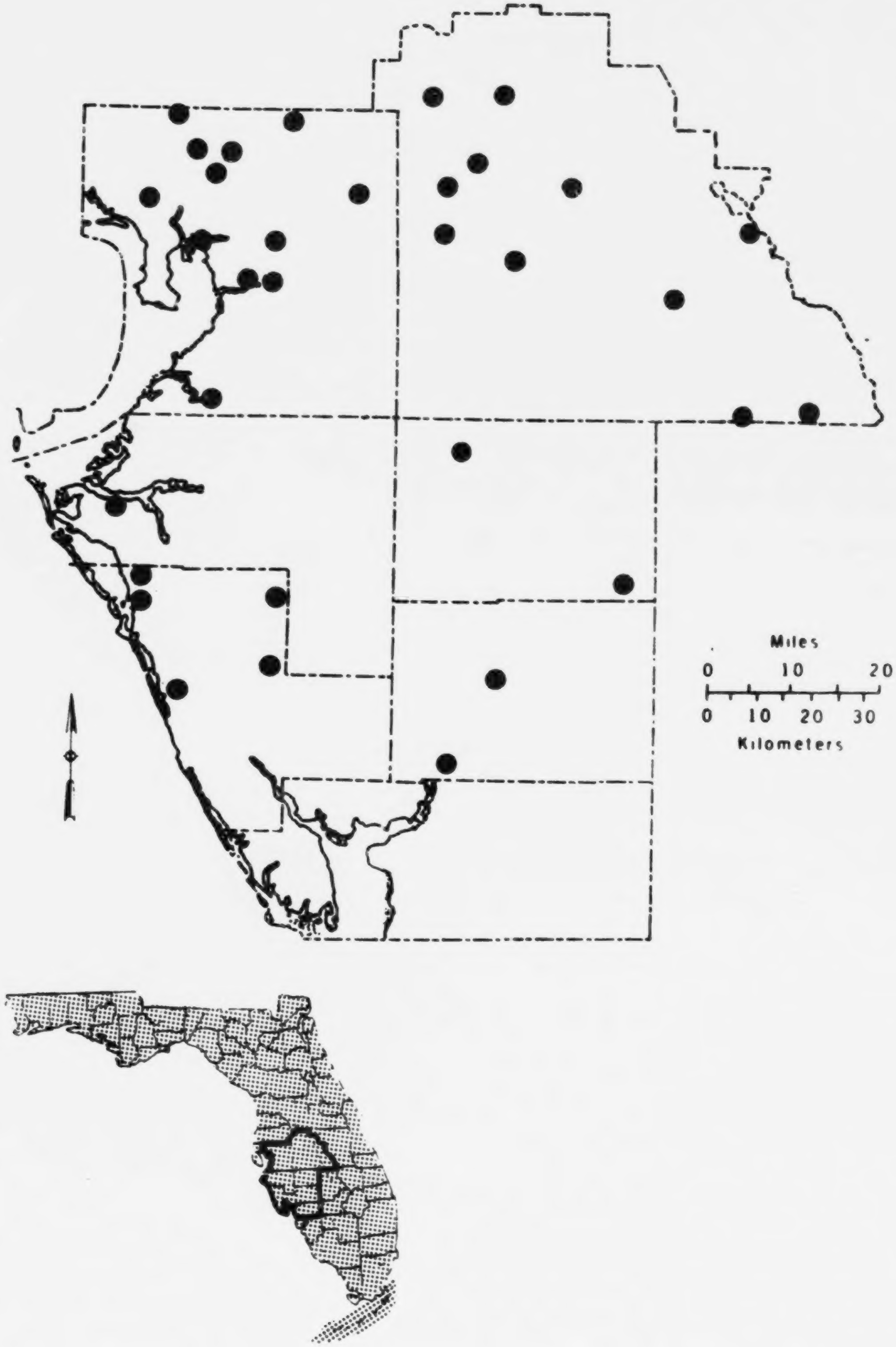
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Fig. VIII.D.124. SCREECH OWL (Otus asio)

Biologically Significant

GREAT HORNED OWL — Bubo virginianus (Gmelin)

Order Strigiformes — Family Strigidae

Distribution: The Great Horned Owl is recorded from Charlotte, DeSoto, Hillsborough, Manatee, Polk and Sarasota counties and undoubtedly occurs in Hardee as well. The species has one of the most extensive breeding ranges of any North American bird. It is found throughout the continent south of the arctic tundra. The species is not known to migrate.

Habitat: In Florida the Great Horned Owl prefers open pine flatwoods, but also occurs in mixed hardwood swamps, and other open wooded or forest edge areas. Great Horned Owls often hunt over treeless brushlands. In fact, the close proximity of huntable areas to the woodland roosts may be a critical habitat requirement. Another key habitat factor is the presence of suitable nest sites, as the selected home range of a Great Horned Owl probably is maintained throughout the year (Craighead and Craighead 1969). Nest sites recorded in the seven-county area include old Bald Eagle nests in a slash pine at Lake Livingston, Polk County (Poitevint et al. unpubl. MS) and at Oscar Scherer State Park (Preston 1964), Hillsborough and Myakka river state parks (Stevenson 1967, Fla. Dept. Nat. Res. 1976), the Ringling Museum grounds at Sarasota (T. Brungardt pers. comm.), and an old phosphate mined area at Orange Park near Lakeland, Polk County (J. B. Funderburg pers. comm.).

Population Status: Though less secretive than the Screech Owl, the Great Horned Owl, which is a common permanent resident in the seven-county area and state as a whole, is also a nocturnal hunter and therefore not easily censused. Christmas Bird Counts in the seven-county area usually record an average of 2 to 3 owls per count. The highest counts in the area are from Lakeland where the owls have been seen yearly since 1966, the average number recorded being 6. Population studies in other parts of its range show densities of from one bird per 2000 acres to one per 100 acres (Craighead and Craighead 1969).

Basis for Priority Status: As a large predatory bird, this owl has received much attention because of the prey items it selects, which often include domestic poultry and native game species (Sprunt 1954). Often overlooked, however, is the fact that the Great Horned Owl also preys heavily on rodents and rabbits, and, in part, selects its habitat by the abundance of this food source. Therefore in natural areas the species may act as an indicator of rodent and other small mammal populations.

Potential Impacts of Mining: Large scale disturbance by mining of nesting, foraging, and/or roosting sites may result in reduced numbers of this species in the seven-county area. Certain types of reclaimed lands would probably provide adequate foraging areas but lack of suitable lookout perches and nest sites may prevent their use by Great Horned Owls. Field studies are necessary to quantify the area required to support viable populations.

Selected References:

*Craighead, J. J., and F. C. Craighead, Jr. 1969. Hawks, owls, and wildlife. Dover Publications, Inc., New York.

*Florida Department of Natural Resources. 1976. Vertebrates of Myakka River State Park. 26 pp.

*Poitevint, H., J. Johnston, and L. Sicarello. Aerial survey of Bald Eagle nest sites. U. S. Fish and Wildl. Serv. Unpubl. MS.

*Preston, C. 1964. Sarasota area. Fla. Nat. 37(1):10-11.

*Sprunt, A. 1954. Florida bird life. Coward-McCann, Inc., New York. 527 pp.

Stevenson, H. M. 1976. Vertebrates of Florida, identification and distribution. Univ. Presses of Fla., Gainesville. 607 pp.

*Stevenson, J. A. 1967. A list of the vertebrates identified in Hillsborough River State Park. Fla. Brd. of Parks. 16 pp.

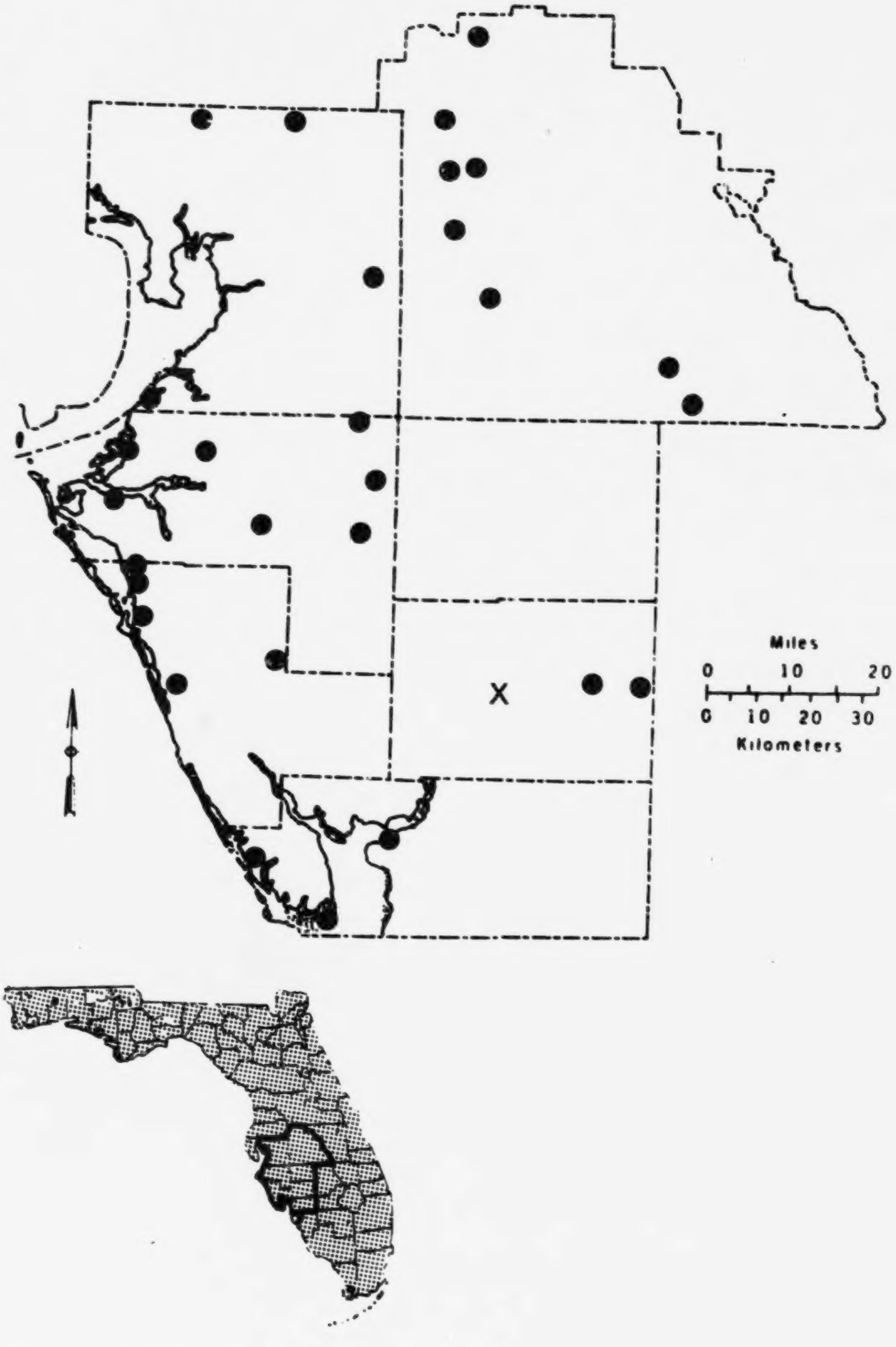
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Fig. VIII.D.125. GREAT HORNED OWL (Bubo virginianus)

Listed - Species of Special Concern, Blue List

FLORIDA BURROWING OWL

Athene cunicularia floridana Ridgway

Order Strigiformes

Family Strigidae

Other Names: Ground Owl, Prairie Owl, Howdy Owl

Distribution: The Florida Burrowing Owl resides throughout the seven-county area and central Florida. The type locality of the subspecies is in Manatee County, 16 miles east of Sarasota Bay. Records are available from every county. The breeding range, as originally reported by Howell (1932) and Sprunt (1954), is still mainly centered in central Florida. However, Ligon (1963) reported non-contiguous breeding records as far north as Alachua County and as far south as Marathon Key. The Florida race is also resident outside of Florida, to Alabama, Cuba, and the Bahamas (Stevenson 1976). Other races range from southwestern Canada to central Mexico and have been recorded as accidental in Florida (Ligon 1963).

Habitat: This owl is a resident of grasslands and dry prairies or any well-drained sandy ground with little growth, such as the grassy expanses of air fields (e.g. Miami International Airport) and open areas of industrial parks or college campuses (e.g. industrial park and nearby campus of the University of South Florida in Tampa) (Owre 1976; W. B. Courser pers. comm.). The owls nest in burrows which they dig themselves. Burrow sites generally are in large open areas in which the grass is kept grazed or mowed with suitable low perches, such as fences or telephone guy-wires, nearby.

Population Status: The Florida Burrowing Owl is uncommon in the seven-county area, but may be found in isolated local concentrations in suitable habitat. The best example of local abundance is given by the Christmas and Summer Bird

Counts in Tampa, where virtually all burrow sites are known and censused frequently (W. B. Courser pers. comm.). The following table shows the total number of Burrowing Owls counted in this area for 1972-1977. Summer counts include recently fledged birds and thus are higher than the winter counts.

Season	Year 1972	1973	1974	1975	1976	1977
Summer	68	37	17	24	26	14
Winter	33	28	20	11	12	11

In Tampa, as in many other places where the owls are found in Florida, the population is decreasing, because of loss of habitat. To some extent, the range of the Burrowing Owl in Florida has been extended and shifted by man's replacement of woodlands with pastures, and by the creation of lawns on campuses and industrial parks. However, increased development in these urban areas as well as in areas of native habitat has conspicuously depressed Burrowing Owl populations.

Basis for Priority Status: The Florida Burrowing Owl is listed as a Species of Special Concern by the Florida Committee on Rare and Endangered Plants and Animals, and the species as a whole is included on the 1977 Blue List of the National Audubon Society on the basis of its decline in numbers in Florida and elsewhere in the range.

Potential Impacts of Mining: Mining would destroy a significant proportion of actual and potential existing habitats of this species in the seven-county area. However, certain types of reclaimed lands, specifically dry, open grasslands, might at least partly compensate for natural habitat losses. A question that needs answering concerns the suitability of soils disturbed by mining for burrow construction.

Selected References:

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

*Ligon, J. D. 1963. Breeding range expansion of the Burrowing Owl in Florida. Auk 80:367-368.

*Owre, O. T. 1976. Florida Burrowing Owl, Pages 904-910 in Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

*Sprunt, A., Jr. 1954. Further light on the Florida Burrowing Owl. Fla. Nat. 27(2):43-44, 63.

*Stevenson, H. M. 1976. Vertebrates of Florida, identification and distribution. Univ. Presses of Fla., Gainesville. 607 pp.

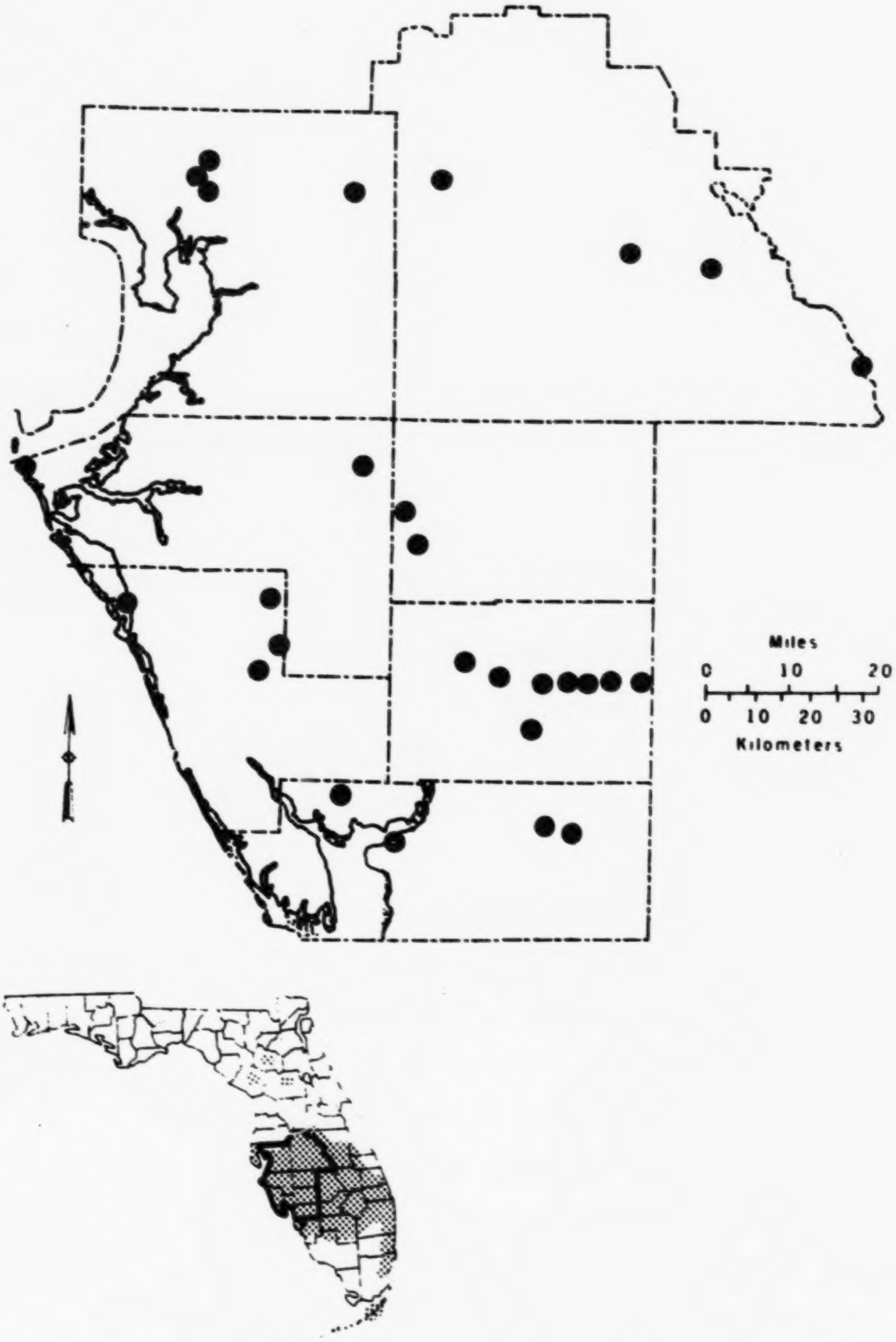
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Fig. VIII.D.126. FLORIDA BURROWING OWL (Athene cunicularia floridana)

Biologically Significant

BARRED OWL Strix varia Barton

Order Strigiformes Family Strigidae

Distribution: The Barred Owl is recorded from all seven counties in the study area. It is a permanent resident throughout mainland Florida, and ranges north throughout the eastern and central United States and across southern Canada from Nova Scotia west to British Columbia.

Habitat: The Barred Owl is a hardwood forest bird inhabiting mixed hardwood and cypress swamps and live oak and cabbage palm hammocks. In the seven-county area, the species has been recorded in phosphate mined areas in the vicinity of Orange Park, Polk County (J. B. Funderburg pers. comm.) and along the south prong of the Alafia River, Polk County (Borden Phosphate 1975). Crayfish are included in its diet.

Population Status: This owl is obviously abundant in the seven-county area, but, like the other nocturnal owls there are few actual census data available for it. An estimate of 3 individuals per 100 acres of live oak-cabbage palm hammock was made on a winter bird population census in Hillsborough River State Park (Woolfenden 1968a). Less than 1 pair per 100 acres occupied the same habitat during breeding (Woolfenden 1967, 1968b). Christmas Bird Counts at Tampa, Lakeland, and Myakka River State Park report an average of 7 of these owls seen per count since 1966, with a high of 19 seen on the Myakka 1968-69 count. Counts in other areas, where the habitat is less suitable, usually record less than 5 birds per count.

Basis for Priority Status: The Barred Owl, like other owls, is biologically significant because it is an important predator high on the food chain and thus particularly sensitive to unfavorable environmental changes.

Potential Impacts of Mining: Destruction of forest habitats preferred by this species, particularly swamp wetlands, by mining would significantly affect its status in the seven-county area. Because of its predilection for relatively dense forest cover, it would not be expected to reestablish in most types of reclaimed lands. Even in the case of reforested reclaimed lands, it would take many years until the forest had matured to the point where it would be acceptable to this species.

Selected References:

Bent, A. C. 1938. Life histories of North American birds of prey, Part 2. U. S. Nat. Mus. Bull. 170. 482 pp.

*Borden Phosphate. 1975. Big Four Mine. DRI application.

*Woolfenden, G. E. 1967. Live oak-cabbage palm hammock (Breeding bird census). Aud. Field Notes 21(6):635-637.

*Woolfenden, G. E. 1968a. Live oak-cabbage palm hammock (Winter bird population study). Aud. Field Notes 22(3):488.

*Woolfenden, G. E. 1968b. Live oak-cabbage palm coastal hammock (Breeding bird census). Aud. Field Notes 22(6):676-680.

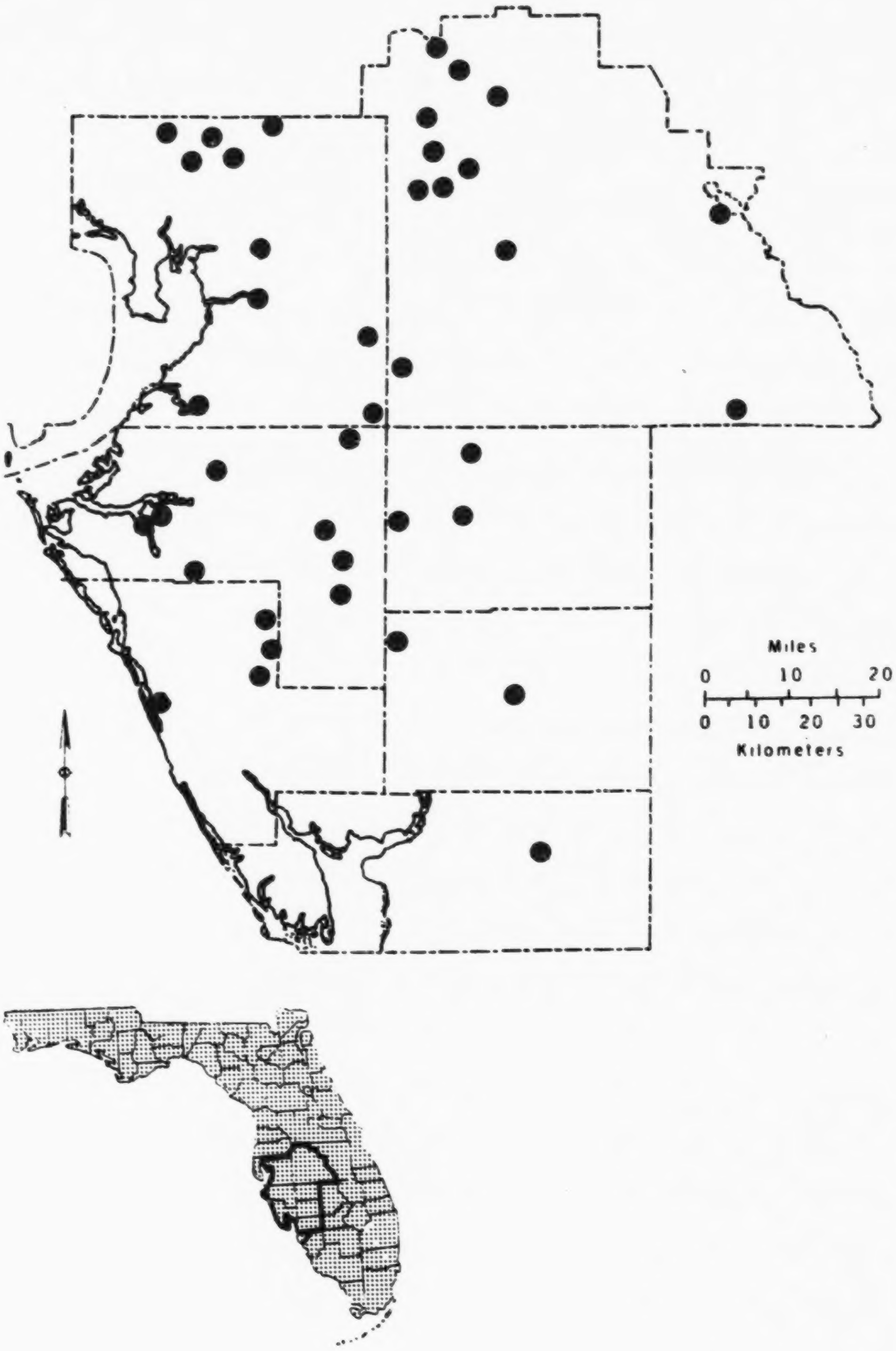
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Fig. VIII.D.127. BARRED OWL (Strix varia)

Listed - Blue List

SHORT-EARED OWL — *Asio flammeus* (Pontoppidan)

Order Strigiformes — Family Strigidae

Distribution: Within the seven-county area the Short-eared Owl has been recorded only from Hillsborough, Manatee, and Sarasota counties. Edscorn (unpubl. MS) places it on the hypothetical list for the Lake Region, Polk County. It is a winter visitor to Florida from October to April and has been recorded as far south in the state as Cape Sable (Howell 1932). Its North American breeding range extends from northern Alaska and Canada south to California and east to Virginia.

Habitat: Unlike most owls the Short-eared Owl frequently hunts by day. It inhabits marshes, meadows, and old fields.

Population Status: This owl is a rare and irregular winter visitor in the seven-county area. In Hillsborough River State Park the species has been recorded only six times in 20 years (Stevenson 1967), and the most recent record from Myakka River State Park was 2 November 1940 (Van Duyn 1941). The Tampa Christmas Bird Count recorded one in winter 1972-1973 and two in 1976-1977.

Basis for Priority Status: This species is listed on the 1977 Blue List of the National Audubon Society on the basis of its declining populations in all parts of the range. Loss of nesting habitat, namely, interior wetlands, is the suspected major cause of the decline.

Potential Impacts of Mining: Destruction of local, interior, natural herbaceous wetlands will further reduce the habitat of this declining species. However, considering its extreme rarity in the seven-county area, this effect of mining would not have a significant impact on the status of the species as a whole. Provision for extensive shallow marshes in reclamation programs would furnish potential habitat.

Selected References:

*Edscorn, J. B. Birds of the Lake Region. Unpubl. MS.

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

*Stevenson, J. A. 1967. A list of the vertebrates identified in Hillsborough River State Park. Fla. Brd. of Parks. 16 pp.

*Van Duyn, G. 1941. Progress report of biological reconnaissance Myakka River State Park, Florida (FLA SP-4) with preliminary checklists of vertebrate fauna. 25 pp.

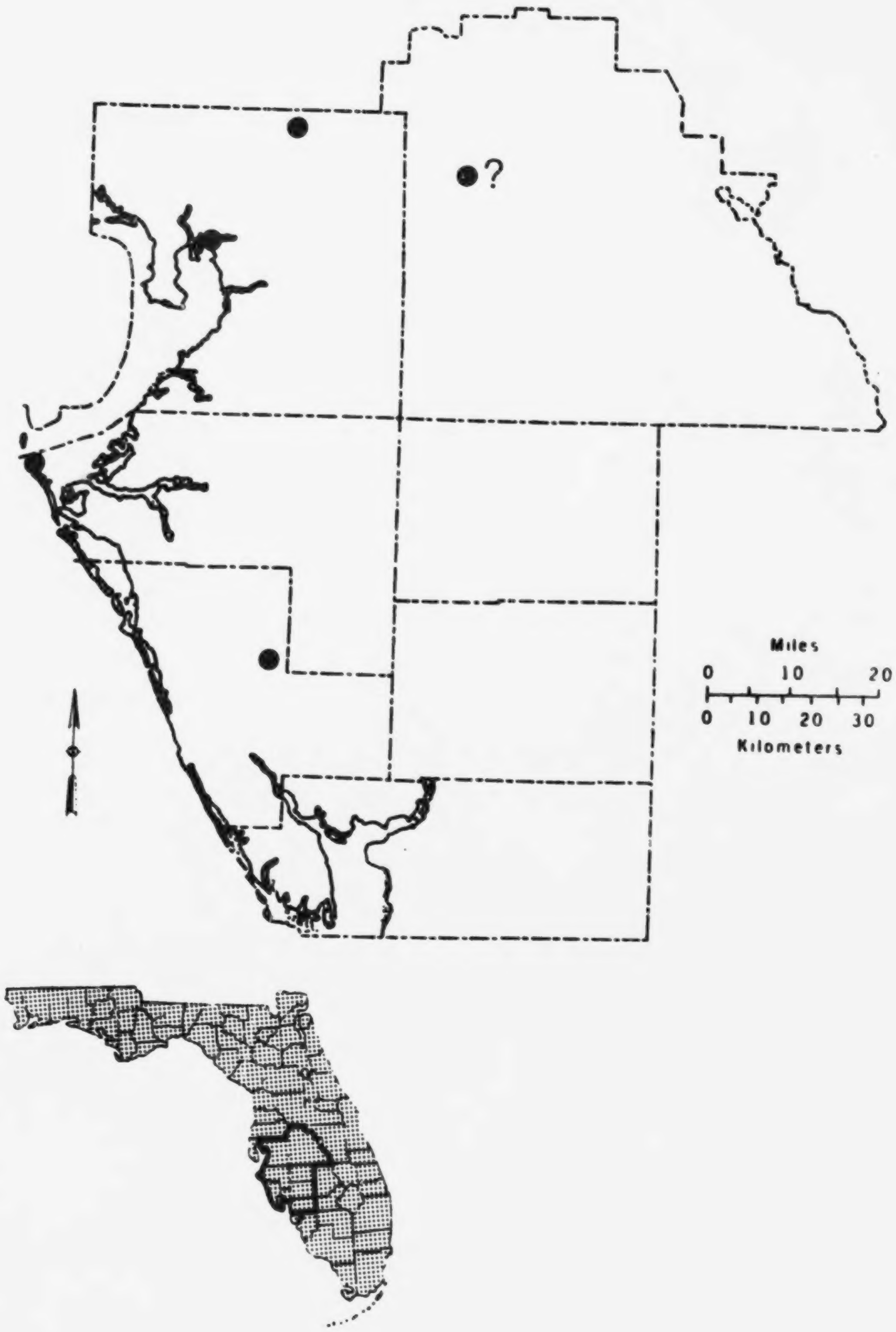
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Fig. VIII.D.128. SHORT-EARED OWL (*Asio flammeus*)

FISH AND WILDLIFE INVENTORY OF THE SEVEN-COUNTY REGION

Archbold Biological Station
Contract No. 14-16-0009-77-005
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Listed - Blue List

COMMON NIGHTHAWK | Chordeiles minor (Forster)

Order Caprimulgiformes | Family Caprimulgidae

Other Names: Bull-bat

Distribution: The Common Nighthawk is a summer resident widely distributed through the seven-county area. The species breeds throughout peninsular Florida south to the middle Florida Keys. The breeding range extends from the southern Yukon across to Newfoundland and south throughout the United States and Mexico. It winters in South America, with a very few individuals remaining in Florida near big cities (Stevenson 1976).

Habitat: This species forages over open areas such as native and man-made grasslands, croplands and old fields, and open woodlands such as pine flatwoods and sand pine scrub. It nests from about April to June on the ground in very sparse pasture or palmetto scrub, sandy edges of dry ponds, and sometimes on the flat roofs of buildings (Sprunt 1954).

Population Status: The Nighthawk is an abundant summer resident in Florida, but few quantitative data on population levels exist. Woolfenden and Rohwer (1969) report an estimated density of 0.2 birds per mile of census in a residential suburb of Bradenton, Manatee County, in the summer of 1963. Tampa Summer Bird Counts yield an average of 23 birds seen per count (range = 6-35) for the years 1972-1977 inclusive, or 3.5 per 10 party hours (G. E. Woolfenden pers. comm.).

Basis for Priority Status: This species is included on the 1977 Blue List of the National Audubon Society because of decreases in abundance in other parts of its range. In the 1940's the West Indian race of the Common

Nighthawk, Chordeiles minor gundlachii, considered by some ornithologists to be a full species, began breeding in the Keys. It has spread northward since then. Thus the Nighthawk is of special scientific interest in south Florida at present.

Potential Impacts of Mining: The elimination of wooded areas and creation of extensive open areas with barren places accompanying active mining would presumably favor this species. Areas reclaimed to grassland would also be inhabited. Thus, extensive mining in the seven-county area would probably have a positive overall impact on the Nighthawk.

Selected References:

*Sprunt, A., Jr. 1954. Florida bird life. Coward-McCann, Inc., New York. 527 pp.

*Stevenson, H. M. 1976. Vertebrates of Florida, identification and distribution. Univ. Presses of Fla., Gainesville. 607 pp.

*Woolfenden, G. E., and S. A. Rohwer. 1969. Relative abundance of bird populations in residential districts of the Tampa Bay area. Fla. St. Brd. of Health Monogr., No. 12:110-117.

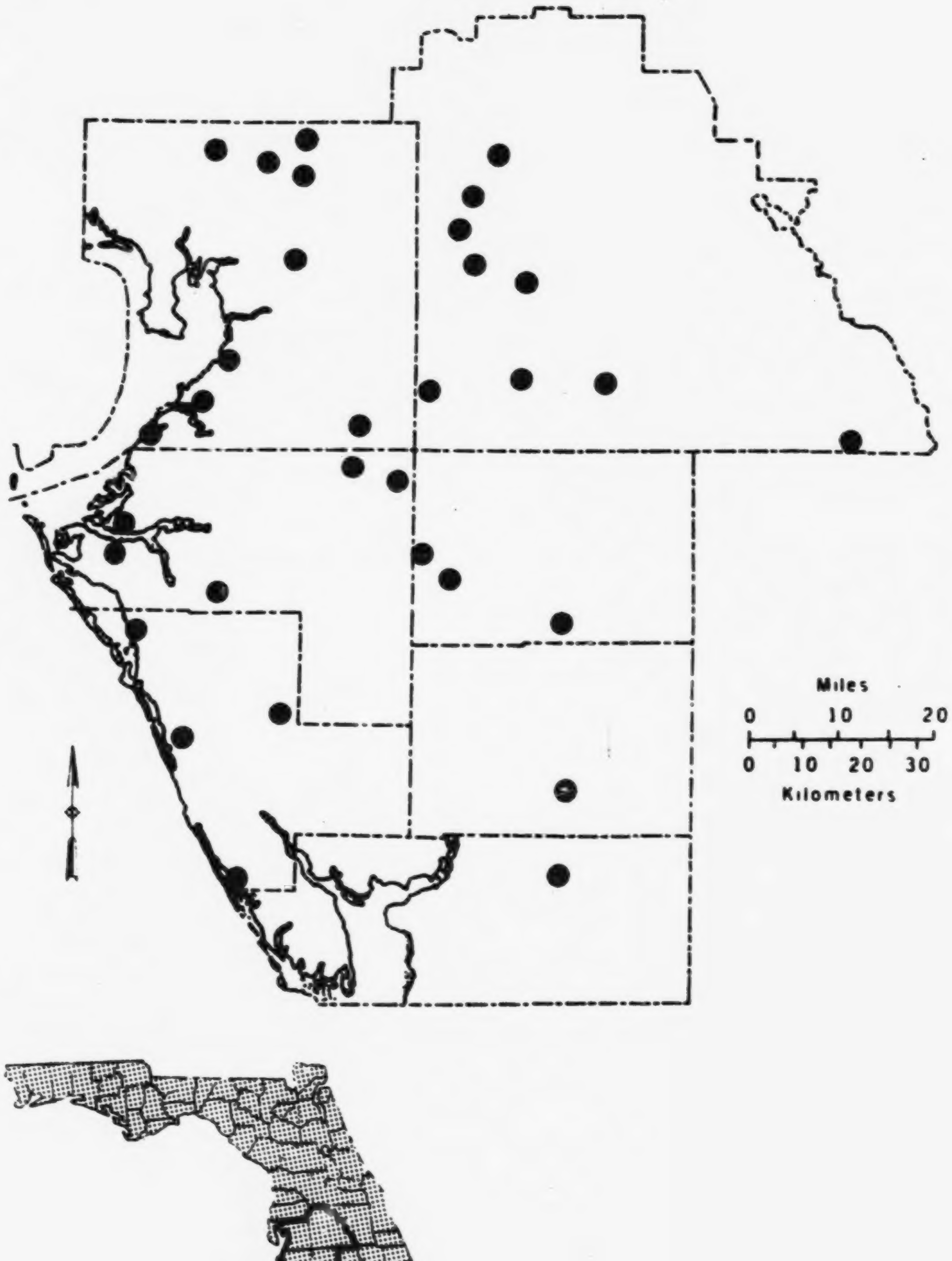
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Fig. VIII.D.129. COMMON NIGHTHAWK (Chordeiles minor)

Biologically Significant

BELTED KINGFISHER   Megaceryle alcyon (Linnaeus)

Order Coraciiformes   Family Alcedinidae

Distribution: The Belted Kingfisher is a winter resident and transient and generally distributed throughout the study area. The southern limit of the breeding range extends down the Florida peninsula to just north of the seven-county area. From there the species breeds northward through the United States and most of Canada. The breeding record for southern Florida (Howell 1932) is discounted by Robertson and Kushlan (1974). The Belted Kingfisher is found throughout southern Florida, including the study area, from about August to April. Stragglers remain until May and early migrants appear in July.

Habitat: The Belted Kingfisher forages in natural and artificial bodies of salt or fresh water ranging from shallow ditches to estuaries and large lakes. They also occur in flooded marshes.

Population Status: The Belted Kingfisher is a common winter resident in the seven-county area. Populations may fluctuate locally, probably reflecting the presence and amount of water in ditches, ponds, and marshes. This probably accounts for the variation in numbers recorded on the winter Archbold Biological Station Roadside Censuses (Table VIII.D.9). As expected, the number of individuals per 10 party hours on the Christmas Bird Counts is higher in the lower, wetter areas than on the Ridge (Table VIII.D.6).

Basis for Priority Status: The Belted Kingfisher is considered biologically significant because of its close dependence on aquatic habitats and wetlands and hence its value as a biological indicator of the health of these environments. Its relatively high position in the food chain and comparative ease in censusing also contribute to its value as an ecological indicator.

Potential Impacts of Mining: Mining activities that reduce the quantity or quality of wetlands and aquatic habitats in the interior or along the coast would negatively impact wintering populations of Belted Kingfishers. Settling ponds and other water bodies created by mining and reclamation would provide potential habitat if such requirements as adequate food fish populations, availability of suitable lookout perches, and proper water depths were met.

Selected References:

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

*Robertson, W. B., Jr., and J. A. Kushlan. 1974. The southern Florida avifauna, Pages 414-452 in Gleason, P. J., ed., Environments of south Florida: present and past. Miami Geol. Soc. Memoir 2. 452 pp.

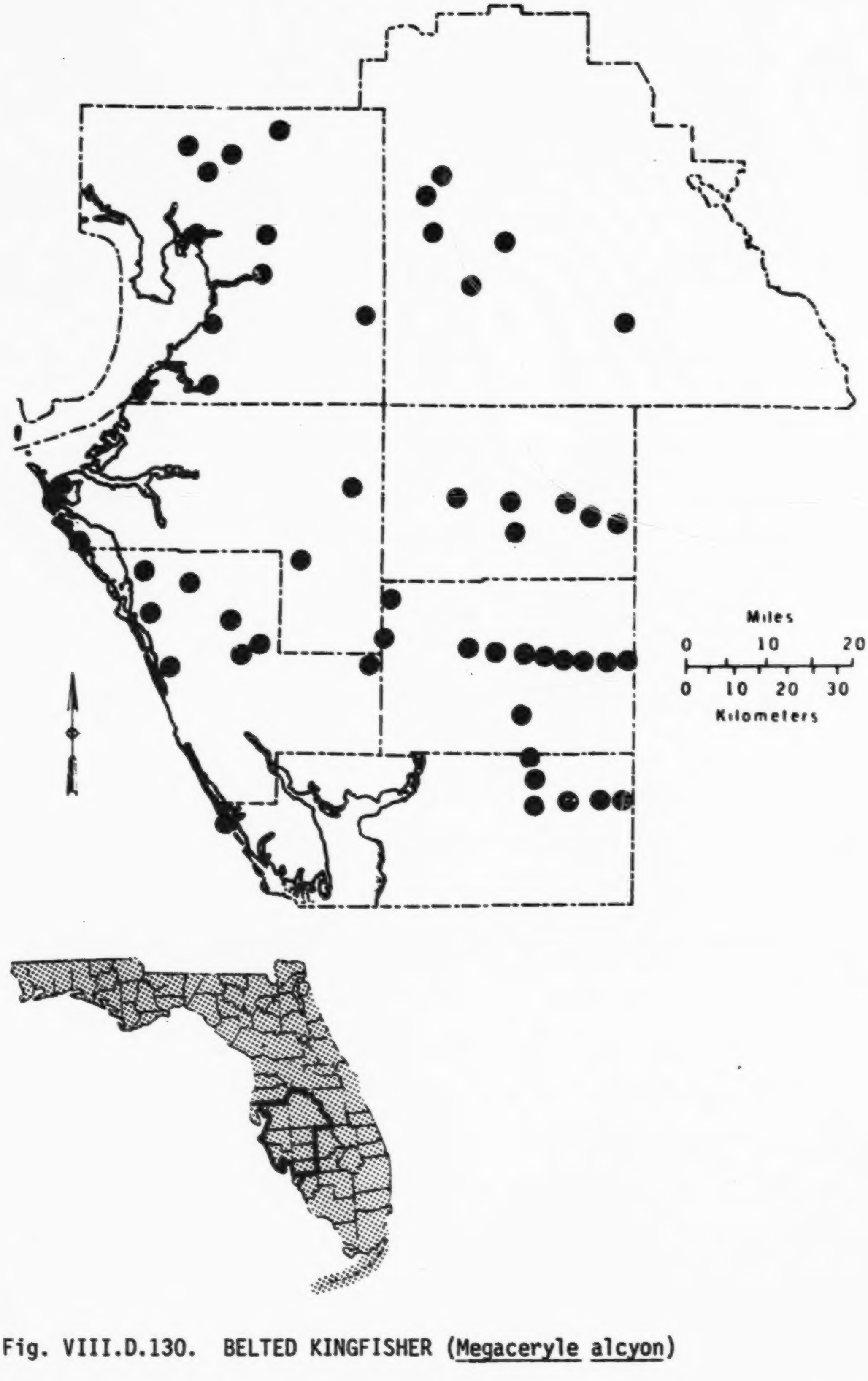
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Fig. VIII.D.130. BELTED KINGFISHER (Megaceryle alcyon)

Biologically Significant

PILEATED WOODPECKER Dryocopus pileatus (Linnaeus)

Order Piciformes Family Picidae

Distribution: The Pileated Woodpecker is a permanent resident in all seven counties. The species ranges from the upper Keys in Florida north throughout the state and beyond to southern Canada, west through the Canadian Rocky Mountains and south to central California. Nesting records in the seven-county area include Myakka and Hillsborough river state parks (Fla. Dept. Nat. Res. 1976, Stevenson 1967), Orange Park in Lakeland, Polk County (J. B. Funderburg pers. comm.), and Sarasota, Sarasota County (T. Brungardt pers. comm.).

Habitat: This large woodpecker depends on extensive wooded areas for both nesting and foraging. Most records from the seven-county area are from pine flatwoods, but numerous records also exist from mixed hardwood swamps and live oak hammocks. Cabbage palm hammocks and cypress swamps are also good habitats. The species nests in holes in living or dead trees.

Population Status: The Pileated Woodpecker is a common resident of the seven-county area but only in areas of suitable habitat. Christmas Bird Count and Breeding Bird Survey data (Tables VIII.D.5, 7) suggest higher populations inland than along the coast. In live oak-cabbage palm forests in Hillsborough River State Park, Woolfenden (1967, 1968) estimated 3 pairs per 100 acres. This is an unusually high density. Sprunt (1954) considered the species to have increased and extended its range into new habitats during the 1940's. In the past decade, the Pileated Woodpecker seems to have maintained a steady population level in the seven-county area

(Table VIII.D.6). It has been seen regularly on Christmas Bird Counts in Myakka River State Park and in Lakeland, the two areas with the highest counts for the species, with numbers ranging from 6 to 27 and 5 to 23, respectively. Because its loud call carries far and is easily identified, numbers recorded on various surveys and counts should be reliable measures of abundance.

Basis for Priority Status: This woodpecker is a good indicator species of large tracts of undisturbed woodlands.

Potential Impacts of Mining: Any activities which would either eliminate or decrease the areas of forest habitats will be detrimental to the species. Types of habitats presently produced in reclamation would be unsuitable. Even on lands planted with trees, it would be many years before the forest was sufficiently mature to attract this species.

Selected References:

*Florida Department of Natural Resources. 1976. Vertebrates of Myakka River State Park. 26 pp.

*Sprunt, A., Jr. 1954. Florida bird life. Coward-McCann, Inc., New York. 527 pp.

*Stevenson, J. A. 1967. A list of the vertebrates identified in Hillsborough River State Park. Fla. Brd. of Parks. 16 pp.

*Woolfenden, G. E. 1967. Live oak-cabbage palm hammock (Breeding bird census). Aud. Field Notes 21(6):635-637.

*Woolfenden, G. E. 1968. Live oak-cabbage palm hammock (Winter bird population study). Aud. Field Notes 22(3):488.

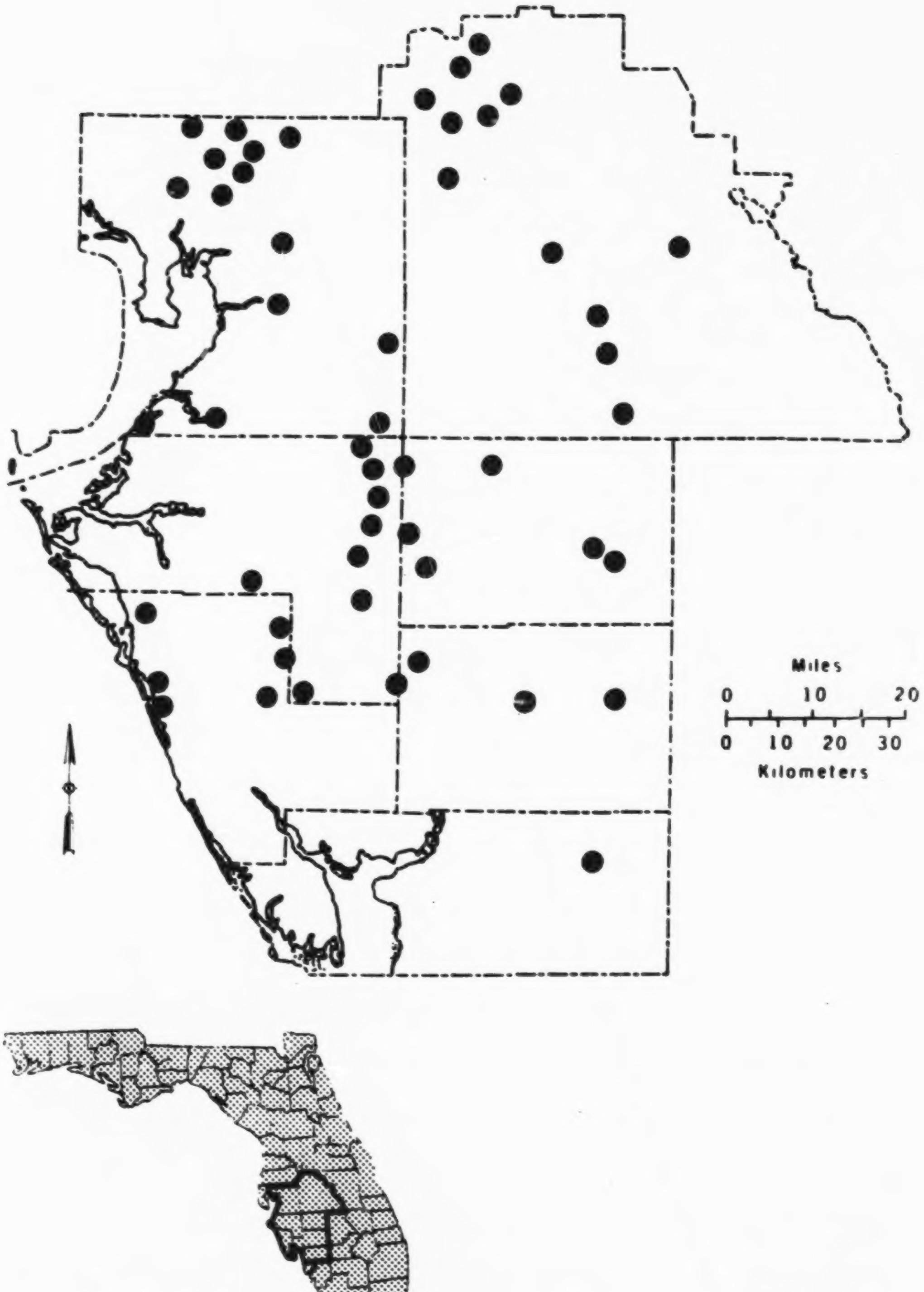
Miles
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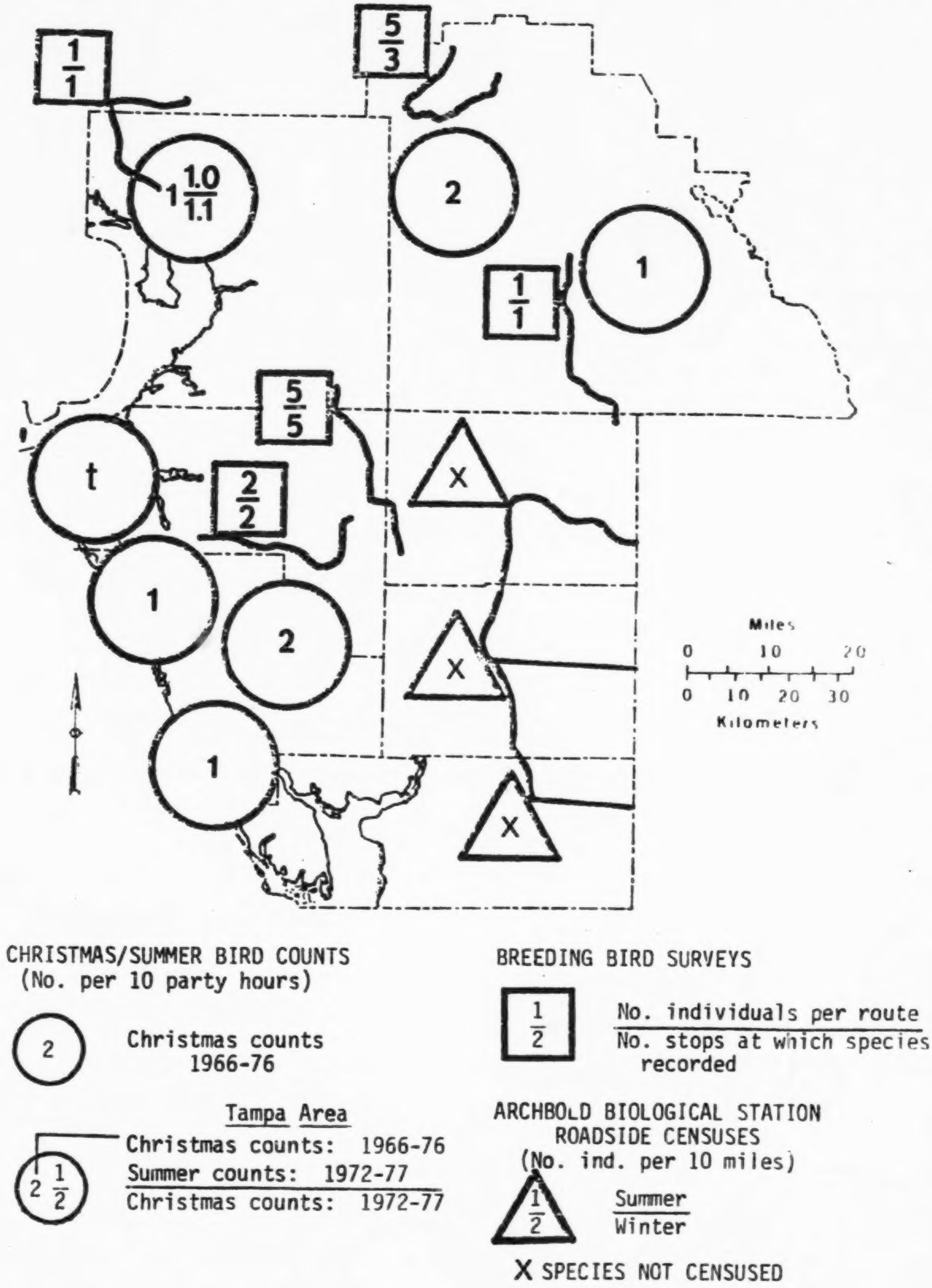
Fig. VIII.D.131. PILEATED WOODPECKER (Dryocopus pileatus)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X
Miles
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0 10 20 30
Kilometers
CHRISTMAS/SUMMER BIRD COUNTS
(No. per 10 party hours)
2
Christmas counts 1966-76
Tampa Area
2 1/2
Christmas counts: 1966-76
Summer counts: 1972-77
Christmas counts: 1972-77
BREEDING BIRD SURVEYS
1/2
No. individuals per route
No. stops at which species recorded
ARCHBOLD BIOLOGICAL STATION ROADSIDE CENSUSES
(No. ind. per 10 miles)
1/2
Summer
Winter
X SPECIES NOT CENSUSED

Fig. VIII.D.132. PILEATED WOODPECKER (*Dryocopus pileatus*). Population data.

Listed - Blue List

RED-HEADED WOODPECKER — *Melanerpes erythrocephalus* (Linnaeus)

Order Piciformes — Family Picidae

Distribution: Records of the Red-headed Woodpecker, a permanent resident in peninsular Florida, exist for all seven counties. Specific nest records from the seven-county area include Tampa (F. E. Lohrer and J. A. Stallcup pers. comm.) and Hillsborough River State Park (Stevenson 1967) in Hillsborough County, and Sarasota (T. Brungardt pers. comm.) in Sarasota County. Other parts of its breeding range include the central and eastern United States, casually west to California. The species is irregularly migratory and withdraws from northern parts of its breeding range in winter.

Habitat: The Red-headed Woodpecker is an inhabitant of open woodlands, and in the seven-county area has been recorded most often from pine flatwoods and open live oak hammocks. However it also uses the parks, wooded suburbs, forest edges, vacant lots, old fields, and other habitats in developed or disturbed areas (Robertson and Kushlan 1974).

The Red-headed Woodpecker is specialized in its habitat requirements, and seasonal nomadism appears to be a result of these requirements. In the fall, the species searches for open, acorn-bearing habitats such as oak hammocks, that might be exploited that particular season. The habitat also must provide a number of dead trees for storing the mast and should be relatively open to allow for easy defense (Moskovits unpubl. MS). In the spring, these woodpeckers require holes for nest sites and shift their foraging to flycatching; both of these activities impose habitat restrictions.

Population Status: An uncommon resident, the Red-headed Woodpecker is also highly local and may be fairly common one season in a given locality and rare or absent the next. These erratic fluctuations probably are more a result of changes in use of particular localities as nesting or foraging sites than of changes in overall population status. Christmas Bird Counts in the seven-county area illustrate these fluctuations, with the best example being the Myakka River State Park Count in which the species has been recorded only in alternate years since 1966-67, and on the most recent count (20 December 1976) a high of 13 was seen. Woolfenden and Rohwer (1969) estimated the density of Red-headed Woodpeckers in two residential areas of Tampa, Hillsborough County, to be 0.3 individuals per mile in summer 1963 and 0.6 in fall 1962, while in a residential area in Bradenton, Manatee County, density was 1.4 in summer 1963.

Basis for Priority Status: The Red-headed Woodpecker is on the 1977 Blue List of the National Audubon Society on the basis of an observed decline in other parts of its range.

Potential Impacts of Mining: As stands of mature trees and a suitable number of dead trees for nesting and acorn storage are crucial to the existence of the Red-headed Woodpecker, destruction of such habitats by mining would be detrimental to the species. Habitats typical of reclaimed areas are not suitable.

Selected References:

*Moskovits, D. Winter territorial and foraging behavior of Red-headed Woodpeckers in Florida. Unpubl. MS.

*Robertson, W. B., Jr., and J. A. Kushlan. 1974. The southern Florida avifauna, Pages 414-452 *in* Gleason, P. J., ed., Environments of south Florida: present and past. Miami Geol. Soc. Memoir 2. 452 pp.

*Stevenson, J. A. 1967. A list of the vertebrates identified in Hillsborough River State Park. Fla. Brd. of Parks. 16 pp.

*Woolfenden, G. E., and S. A. Rohwer. 1969. Relative abundance of bird populations in residential districts of the Tampa Bay area. Fla. St. Brd. of Health Monogr., No. 12:110-117.

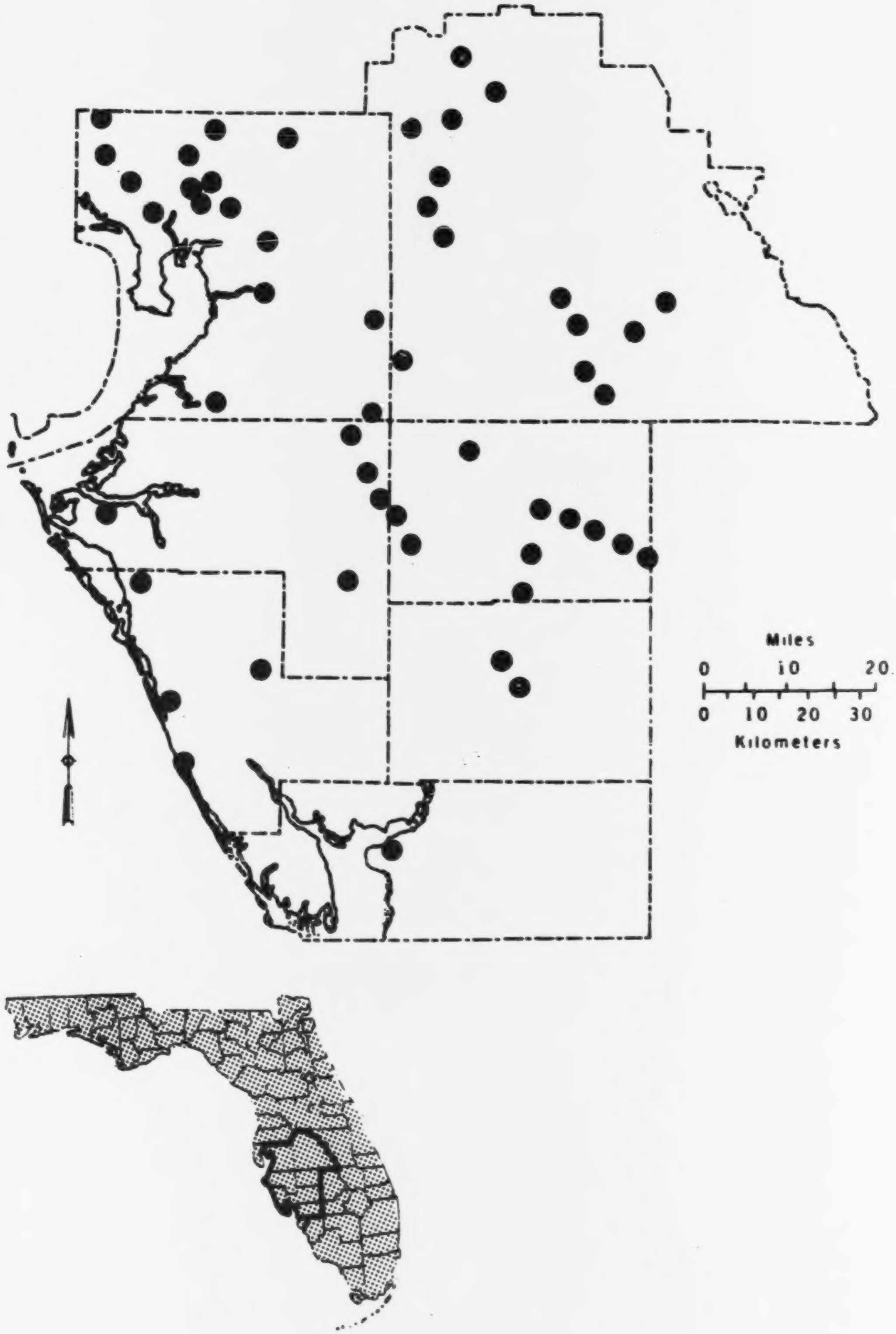
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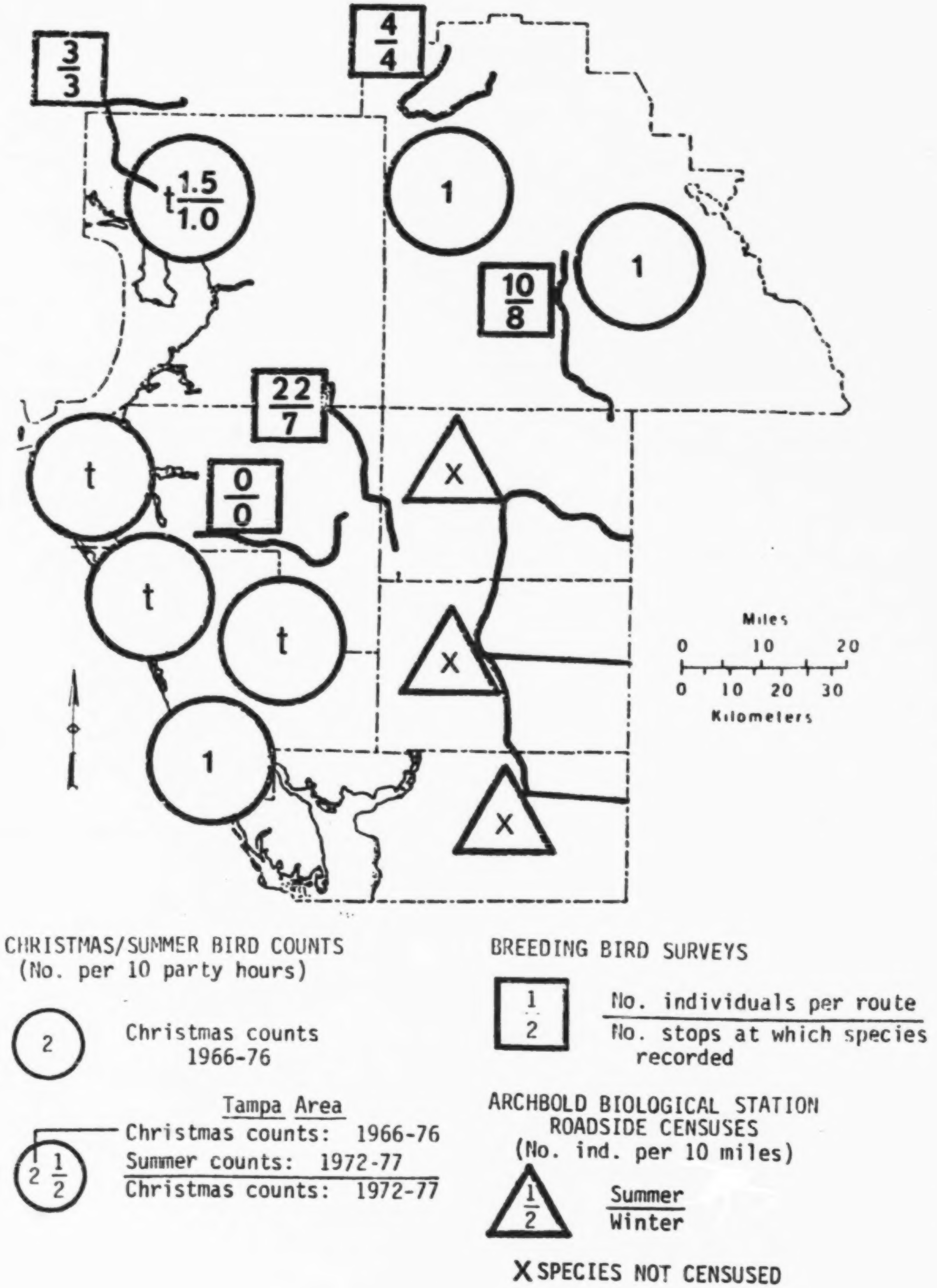
Fig. VIII.D.133. RED-HEADED WOODPECKER (*Melanerpes erythrocephalus*)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Miles
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Kilometers
CHRISTMAS/SUMMER BIRD COUNTS
(No. per 10 party hours)
2 Christmas counts 1966-76
Tampa Area
Christmas counts: 1966-76
2 1/2
Summer counts: 1972-77
Christmas counts: 1972-77
BREEDING BIRD SURVEYS
1/2
No. individuals per route
No. stops at which species recorded
ARCHBOLD BIOLOGICAL STATION ROADSIDE CENSUSES
(No. ind. per 10 miles)
1/2
Summer
Winter
X SPECIES NOT CENSUSED

Fig. VIII.D.134. RED-HEADED WOODPECKER (Melanerpes erythrocephalus). Population data.

Listed - Species of Special Concern, Blue List

HAIRY WOODPECKER — *Picoides villosus audubonii* (Swainson)

Order Piciformes — Family Picidae

Distribution: The Hairy Woodpecker is a permanent resident in the seven-county area. It occurs throughout Florida, with the exception of the Keys and southern mainland. The species is found from approximately the tree-line in Alaska and Canada south throughout the United States. The southeastern race (*P. v. audubonii*), which occurs in Florida, ranges westward along the Gulf to eastern Texas and north to southern Illinois and Indiana.

Habitat: A variety of woodland types found in the seven-county area are desirable habitats of the Hairy Woodpecker, including mixed hardwood and cypress swamps, live oak hammocks, pine flatwoods, and sand pine scrub. A common denominator of preferred habitats appears to be isolation from human habitations (Owre 1976). The species seems to prefer stands of dead trees (Woolfenden 1974).

Population Status: The Hairy Woodpecker is uncommon and very local in the seven-county area. Christmas Bird Counts in the seven-county area over the past decade (Table VIII.D.5) show less than one individual per 10 party hours seen each year. Surveys by Stevenson (1975) in summer produced .05 sightings per hour in Polk County, .02 per hour in DeSoto, Hardee, Hillsborough, and Manatee counties, and .01 per hour in Charlotte County. Owre's (1976) analysis of 272 Christmas Bird Counts for the years 1964-1973 inclusive showed a total of 288 Hairy Woodpeckers, which among the woodpeckers recorded was second in scarcity only to the Red-cockaded. In comparison, his calculations showed 1527 Downy, 2029 Pileated, and 15,620 Red-bellied woodpeckers. Number of individuals per unit area was estimated for a live oak-cabbage palm hammock in Hillsborough River State Park (Woolfenden 1967, 1968) and in an old second growth _Pinus caribaea_ pine yard on Great Abaco, Bahamas (Robertson 1955). Less than one individual per 100 acres in summer and three in winter occupied the hardwood habitat, whereas 6 pairs per 100 acres were recorded in the pine habitat.

Basis for Priority Status: The southern race of the Hairy Woodpecker (_D. v. audubonii_) is listed as a Species of Special Concern by the Florida Committee on Rare and Endangered Plants and Animals because of its rarity and suspected decline in Florida. The species as a whole is included on the 1977 Blue List of the National Audubon Society on the basis of declines in populations in a number of regions.

Potential Impacts of Mining: Large-scale destruction of mature pineland and other forest types in the seven-county area would be detrimental to this species. Habitats typically produced in reclamation are not suitable.

Selected References:

*Owre, O. T. 1976. Southern Hairy Woodpecker, Pages 911-917 _in_ Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

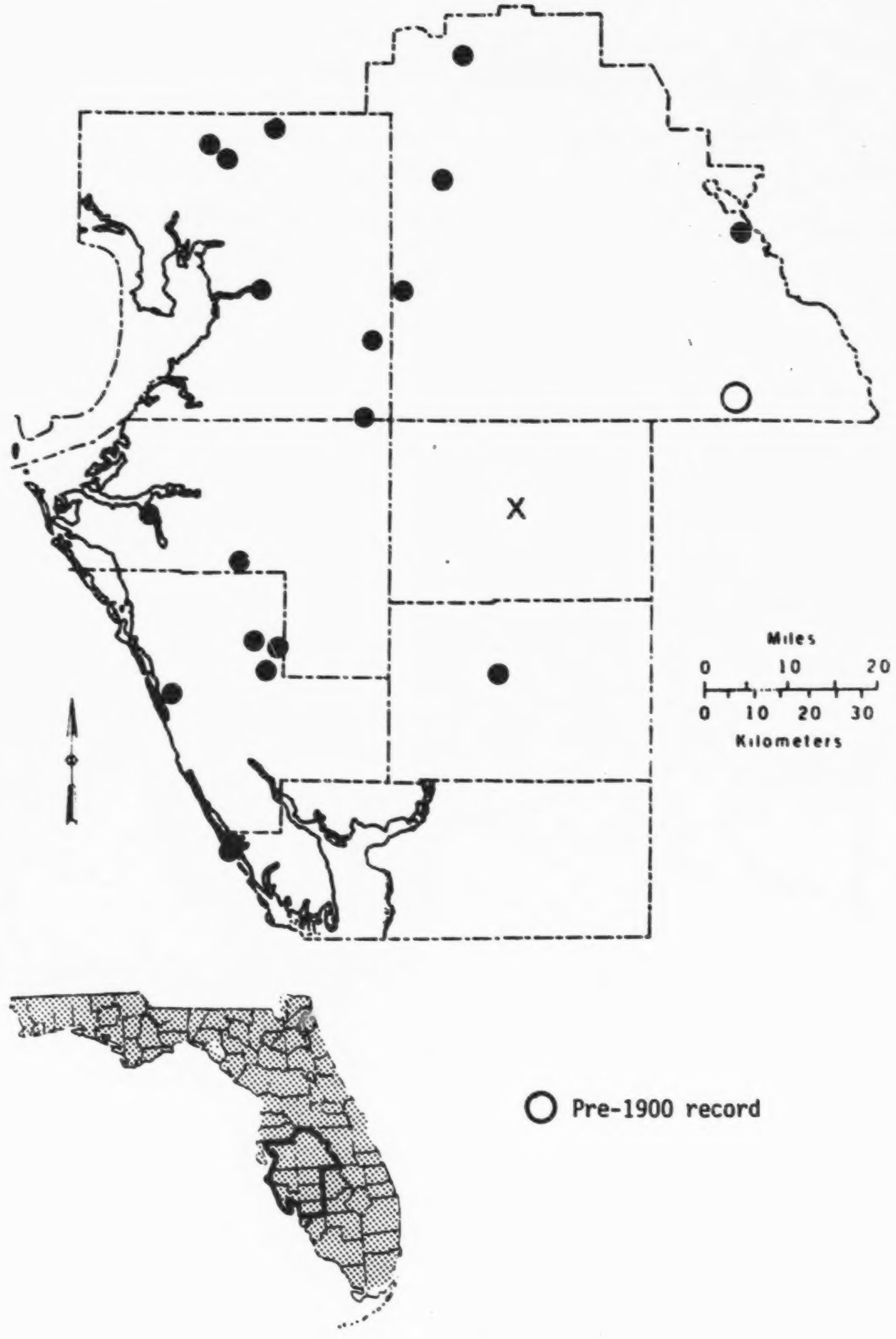
*Robertson, W. B., Jr. 1955. An analysis of the breeding-bird populations of tropical Florida in relation to the vegetation. Ph.D. Thesis. Univ. of Ill., Urbana.

*Stevenson, H. M. 1975. Report to the Game and Fresh Water Fish Commission on avian forms of special concern in Florida. Progress Rept., Job XIV-A-4. 63 pp.

*Woolfenden, G. E. 1967. Live oak-cabbage palm hammock (Breeding bird census). Aud. Field Notes 21(6):635-637.

*Woolfenden, G. E. 1968. Live oak-cabbage palm hammock (Winter bird population study). Aud. Field Notes 22(3):488.

*Woolfenden, G. E. 1974. Bird habitat distribution and population estimates, Pages 54-66 _in_ Cowell, B. C., _et al_., Biological assessment of the Lower Hillsborough Flood Detention Area for recommendation of ecologically based land management. Univ. of So. Fla., Tampa. 111 pp.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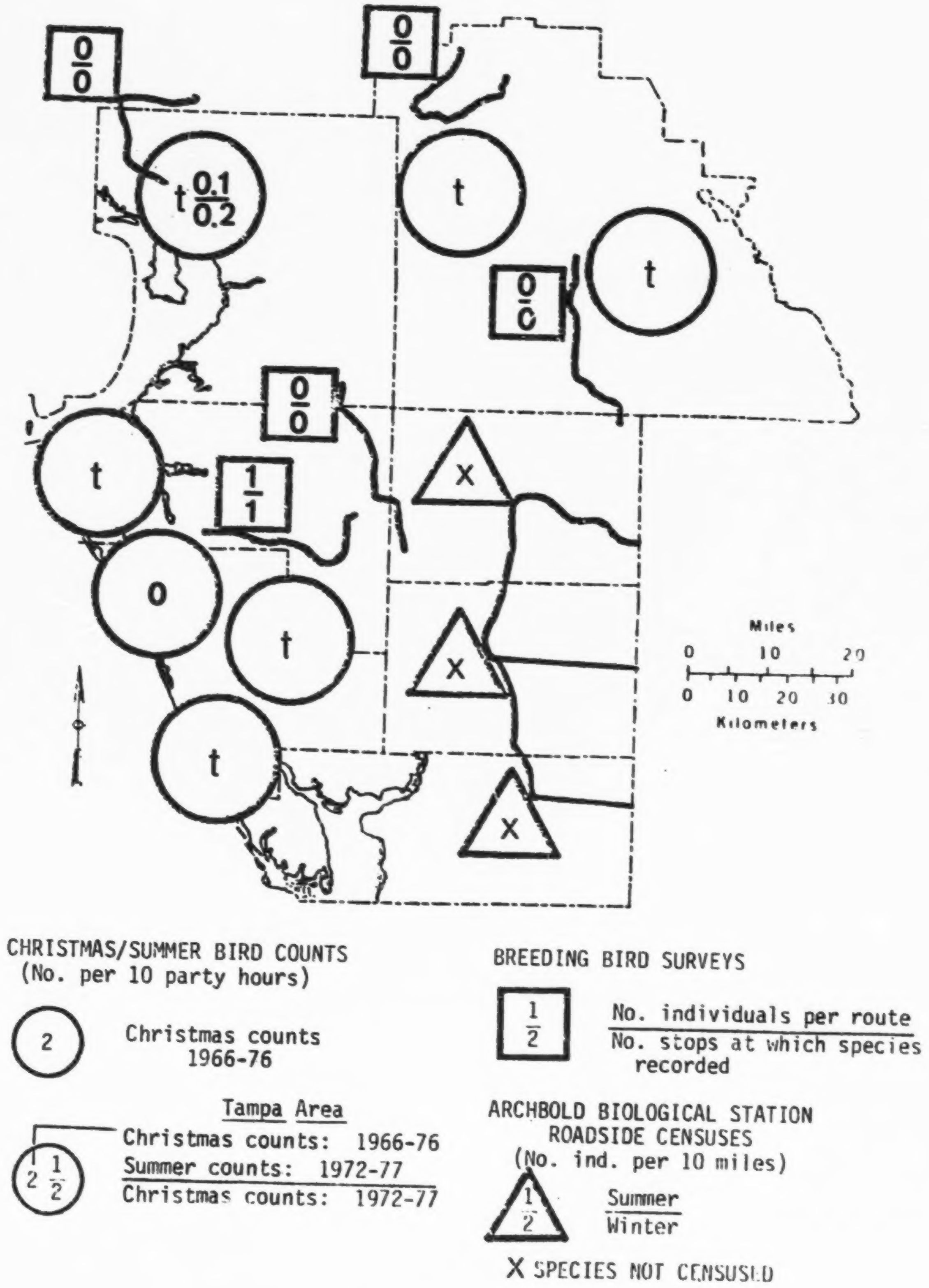
○ Pre-1900 record

Fig. VIII.D.135. HAIRY WOODPECKER (*Picoides villosus audubonii*)



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Kilometers
CHRISTMAS/SUMMER BIRD COUNTS
(No. per 10 party hours)
2
Christmas counts 1966-76
Tampa Area
2 1/2
Christmas counts: 1966-76
Summer counts: 1972-77
Christmas counts: 1972-77
BREEDING BIRD SURVEYS
1/2
No. individuals per route
No. stops at which species recorded
ARCHBOLD BIOLOGICAL STATION ROADSIDE CENSUSES
(No. ind. per 10 miles)
1/2
Summer
Winter
X SPECIES NOT CENSUSED

Fig. VIII.D.136. HAIRY WOODPECKER (Picoides villosus audubonii). Population data.

Listed - Endangered

RED-COCKADED WOODPECKER — Picoides borealis (Vieillot)

Order Piciformes — Family Picidae

Distribution: The range of the Red-cockaded Woodpecker in Florida includes the entire seven-county area. Records are available for each county. The species has been recorded in recent years south to northern parts of Monroe and Palm Beach counties, and formerly to southern Dade County (Stevenson 1976). It ranges north to southeastern Virginia and west along the Gulf coast to eastern Texas.

Habitat: This is a bird of very narrow habitat requirements. In Florida it is found exclusively in pine flatwoods, particularly open stands of mature pines. For nesting and roosting, it excavates cavities in living pines which are diseased by red heart fungus (Fomes pini) which softens the heartwood.

Population Status: In Florida the Red-cockaded Woodpecker, which Howell (1932) referred to as "locally common" and Sprunt (1954) as uncommon, is now rare. Population decreases also have occurred in other parts of the species' range. Jackson (1971) estimated the population in Florida to be 781, and Baker (1976) reports numbers are diminishing. Stevenson's (1975) efforts to estimate density in summer resulted in less than .04 birds seen per hour of field work in DeSoto and Hardee counties, .01 in Charlotte, and less than .01 in Hillsborough and Manatee.

Basis for Priority Status: The Red-cockaded Woodpecker is listed as Endangered by the U. S. Department of the Interior, Florida Game and Fresh Water Fish Commission, and the Florida Committee on Rare and Endangered Plants and Animals. Logging of mature pines, especially selective cutting of diseased trees on which the species depends, is responsible for the decline of the species. The small population in Florida, where the species is thought to have evolved, is second in number only to that of South Carolina (Jackson 1971). Thus it is important that the Florida population be maintained through proper management practices.

Potential Impacts of Mining: Because of the extremely specific habitat requirements of this species any elimination of extensive mature pine flatwoods by mining would result in elimination of actual or potential Red-cockaded Woodpecker habitat in the seven-county area. Attempts to reestablish suitable habitat for the species in reclaimed areas would take many years and require availability of "seed stock" in the general region.

Selected References:

*Baker, W. W. 1976. Red-cockaded Woodpecker, Pages 696-700 in Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

*Jackson, J. A. 1971. The evolution, taxonomy, past populations and current status of the Red-cockaded Woodpecker, Pages 4-29 in Thompson, R. S., ed., The ecology and management of the Red-cockaded Woodpecker. Bur. Sport Fisheries and Wildl. (USDI) and Tall Timbers Res. Sta. 188 pp.

*Sprunt, A., Jr. 1954. Florida bird life. Coward-McCann, Inc., New York. 527 pp.

*Stevenson, H. M. 1975. Report to the Game and Fresh Water Fish

Commission on avian forms of special concern in Florida. Progress Rept., Job XIV-A-4. 63 pp.

*Stevenson, H. M. 1976. Vertebrates of Florida, identification and distribution. Univ. Presses of Fla., Gainesville. 607 pp.

Thompson, R. L., ed. 1971. The ecology and management of the Red-cockaded Woodpecker. Bur. Sport Fisheries and Wildl. (USDI) and Tall Timbers Res. Sta. 188 pp.

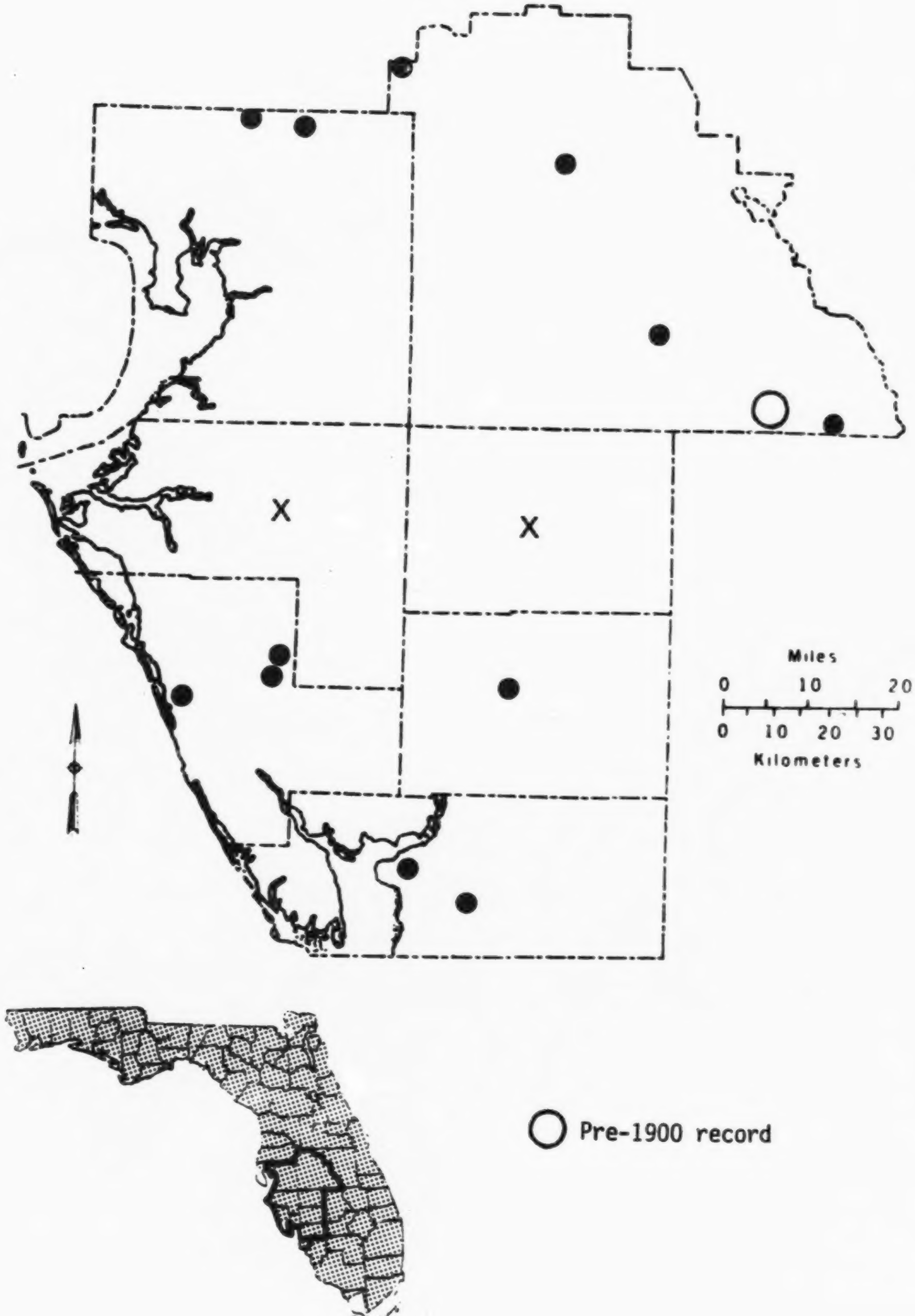

X
X
Miles
0 10 20
0 10 20 30
Kilometers
○ Pre-1900 record

Fig. VIII.D.137. RED-COCKADED WOODPECKER (*Picoides borealis*)

Listed - Endangered

IVORY-BILLED WOODPECKER | *Campephilus principalis* (Linnaeus)

Order Piciformes | Family Picidae

Distribution: Records of the Ivory-billed Woodpecker exist for Charlotte, DeSoto, Hillsborough, Polk, and Sarasota counties. Most of these date from 1883 through 1921, but one alleged sighting in Sarasota County in 1971 was reported by N. Agey (J. N. Layne pers. comm.). The species originally occurred throughout peninsular Florida in suitable habitat, which was thought to be most abundant in the area between the Suwannee and Apalachicola rivers. The latest apparently reliable reports of sightings in Florida are from the Silver River Swamp, Marion County, in 1949, and the Apalachicola Swamp in 1950 (Sprunt 1954) and near Highlands Hammock State Park, Highlands County, in 1969 (Agey and Heinzmann 1971). Its former range also included the south Atlantic and Gulf states and the Mississippi Valley northward to southern Illinois and Indiana.

Habitat: Large mature stands of remote swamps of cypress, gum, and other hardwoods are listed as the habitat required by the Ivory-bill, however, based on the behavior of the Imperial Woodpecker (*Campephilus imperalis*) of Mexico, L. L. Short, Jr. (pers. comm.) suspects the Ivory-bill actually may have required extensive tracts of mature pines, a habitat which has been virtually eliminated by lumbering. Nests are built in cavities excavated by the birds in large tree trunks or limbs. It is believed that the species' diet is restricted to the larvae of certain woodboring insects which utilize recently dead trees.

Population Status: The species is either extinct or nearly so (Hardy 1976).

Basis for Priority Status: The Ivory-billed Woodpecker is listed as Endangered by the U. S. Department of the Interior, Florida Game and Fresh Water Fish Commission, Florida Committee on Rare and Endangered Plants and Animals and the International Union for Conservation of Nature and Natural Resources because of the few individuals, if any, still in existence.

Potential Impacts of Mining: It is extremely unlikely that any individuals of this species presently exist in the seven-county area.

Selected References:

*Agey, H. H., and G. M. Heinzmann. 1971. The Ivory-billed Woodpecker found in central Florida. Fla. Nat. 44:46-47, 64.

*Hardy, J. W. 1976. Ivory-billed Woodpecker, Pages 687-691 in Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

*Sprunt, A., Jr. 1954. Florida bird life. Coward-McCann, Inc., New York. 527 pp.

Tanner, J. S. 1942. The Ivory-billed Woodpecker. Res. Rept. No. 1, Nat. Aud. Soc. 111 pp.

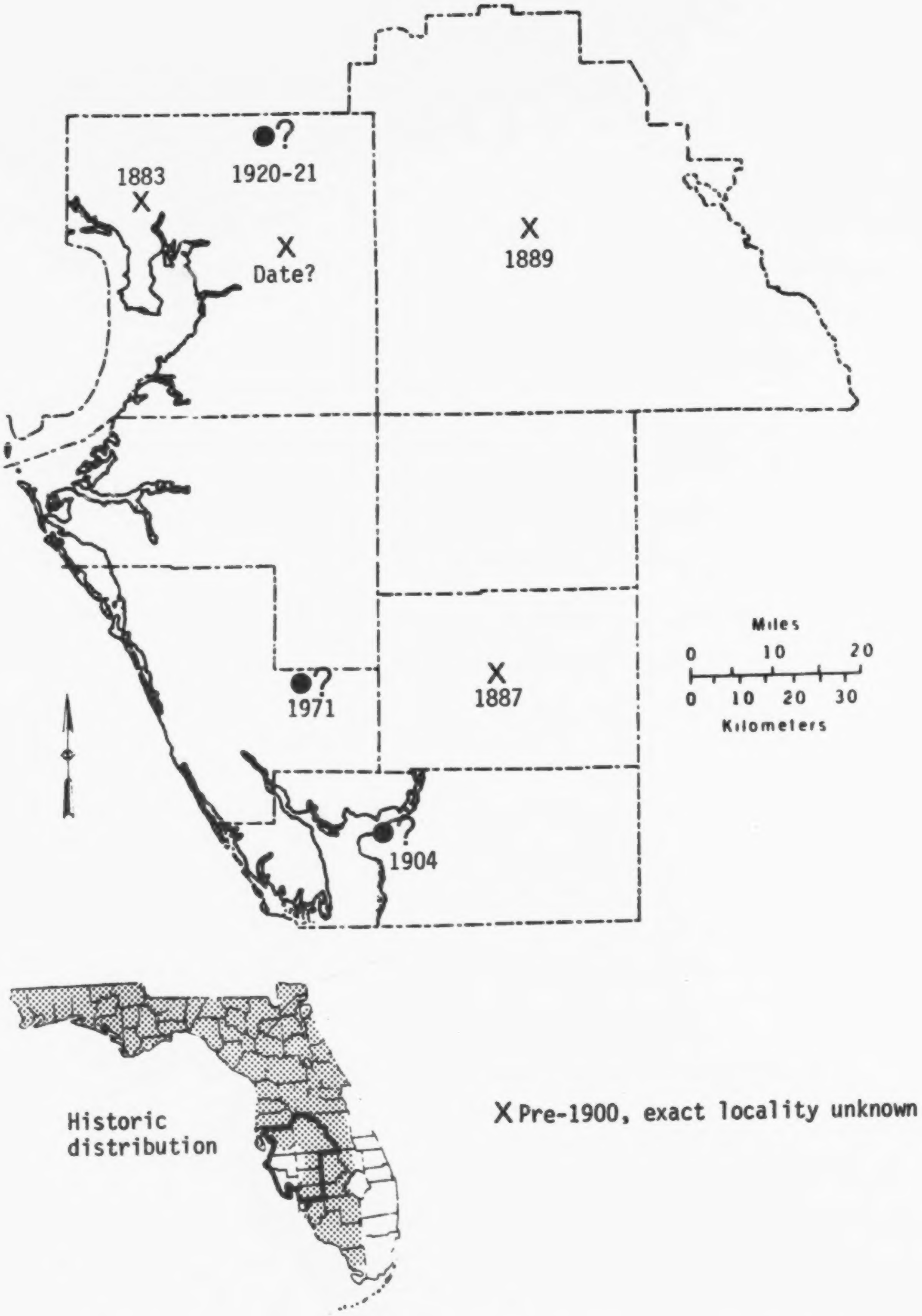

1883
1920-21
Date?
1889
1971
1887
1904
Miles
0 10 20
0 10 20 30
Kilometers
Historic distribution
X Pre-1900, exact locality unknown

Fig. VIII.D.138. IVORY-BILLED WOODPECKER (Campephilus principalis)

Listed - Blue List

CLIFF SWALLOW | *Petrochelidon* *pyrrhonota* (Vieillot)

Order Passeriformes | Family Hirundinidae

Distribution: The Cliff Swallow is a rare migrant in Florida which has been recorded from DeSoto, Hillsborough, Manatee, Polk, and Sarasota counties in the seven-county area. The species normally breeds from Alaska south to central Mexico and east to Georgia and South Carolina, and winters in South America. It has been expanding its breeding range southward in the eastern United States in recent decades. In 1975 Sykes (1976) discovered a small colony of Cliff Swallows nesting in Martin County, Florida, east of the study area and over 500 miles south of its previously known southern limit. The species is listed on the 1977 Blue List of the National Audubon Society because of concern for its status in parts of the eastern United States. There is no reason to suspect that mining would have any detectable impact on the status of the species in the seven-county area or its range as a whole.

Selected *References*:

Sprunt, A., Jr. 1954. Florida bird life. Coward-McCann, Inc., New York. 527 pp.

*Sykes, P. W. 1976. Cliff Swallow breeding in south-central Florida. Wilson Bull. 88(4):671-672.

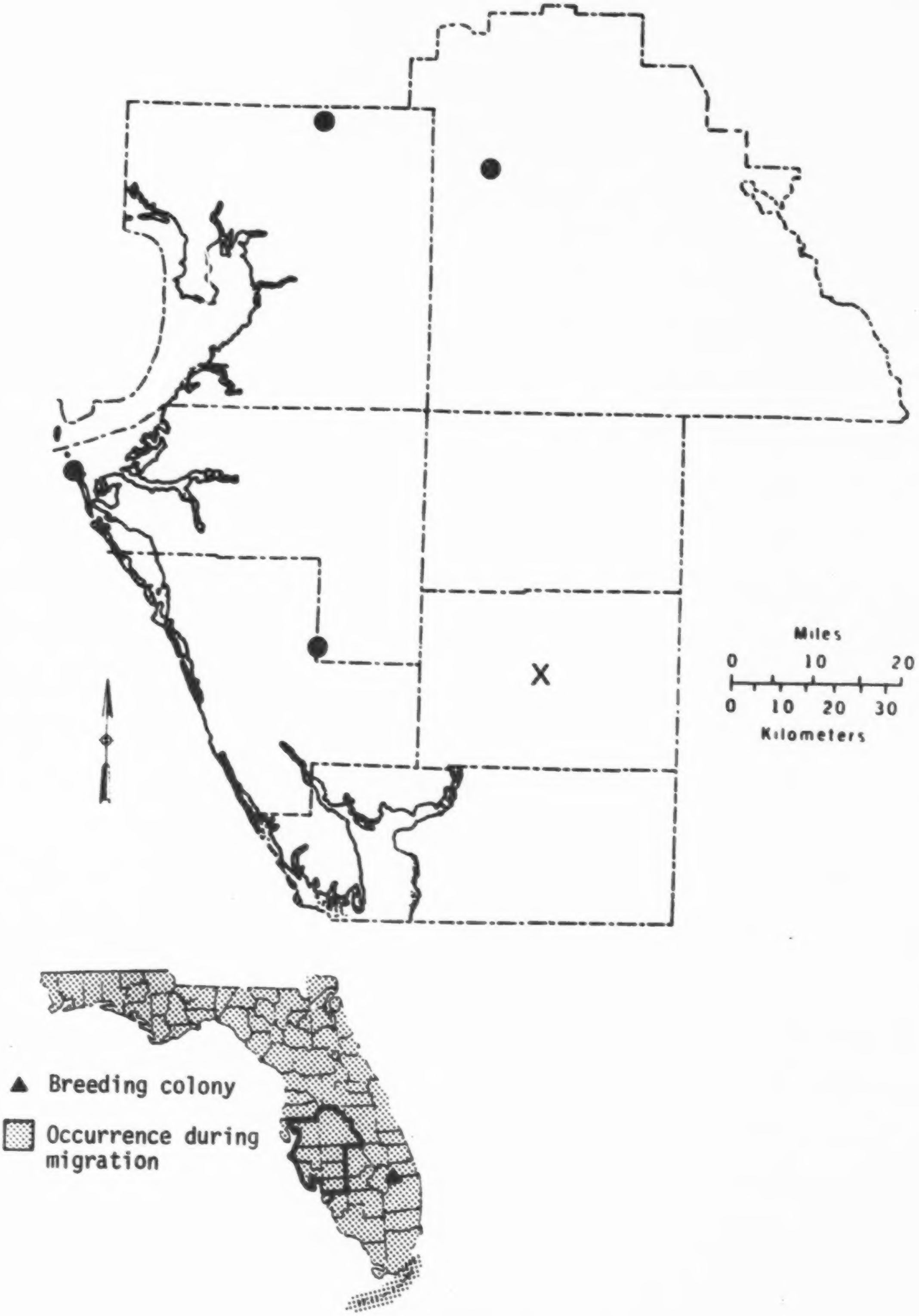

X
Miles
0 10 20
0 10 20 30
Kilometers
▲ Breeding colony
▨ Occurrence during migration

Fig. VIII.D.139. CLIFF SWALLOW (Petrochelidon pyrrhonota)

Listed - Blue List

PURPLE MARTIN | *Progne subis* (Linnaeus)

Order Passeriformes | Family Hirundinidae

Distribution: The Purple Martin is a summer resident in the seven-county area with records existing for all seven counties. The species breeds throughout Florida and the rest of the United States except in the Rocky Mountains. It winters in northern South America, reappearing as early as January and February in North America for nesting.

Habitat: The Purple Martin is "semi-domestic" in its habits, and largely dependent on boxes put up for its use as nesting sites. Sprunt (1954) reported several small colonies using natural cavities in tall dead pines on the Kissimmee Prairie.

Population Status: The Purple Martin is a locally common summer resident in the seven-county area. Woolfenden and Rohwer (1969) estimated its density in residential suburbs to be 2.1 and 0.5 birds per mile of census in Tampa and Bradenton, respectively, in summer 1963. In the fall of 1962 they reported 0.7 per mile of census in Tampa. On Tampa Summer Bird Counts for 1972-1977 inclusive, the average number reported ranges from 7 to 1720. The great variation in numbers is the result of shifting locations of post-breeding roosting flocks (G. E. Woolfenden pers. comm.).

Basis for Priority Status: The Purple Martin has been placed on the 1977 Blue List of the National Audubon Society because of concern for its future in other parts of its range. Local populations in Florida appear to fluctuate primarily with availability of nesting places (Hardy 1955).

Potential Impacts of Mining: Mining and reclamation probably will not affect

Purple Martin populations directly. Increased human interest in providing nest boxes could increase local populations, although the oft-repeated claim of the Purple Martin as a control for local mosquito populations is false (Kale 1968).

Selected References:

*Hardy, L. M. 1955. The Purple Martin. Fla. Wildl. 9(2):7, 50.

*Kale, H. W., II. 1968. The relationship of Purple Martins to mosquito control. Auk 84(4):654-661.

*Sprunt, A., Jr. 1954. Florida bird life. Coward-McCann, Inc., New York. 527 pp.

*Woolfenden, G. E., and S. A. Rohwer. 1969. Relative abundance of bird populations in residential districts of the Tampa Bay area. Fla. St. Brd. of Health Monogr. No. 12:110-117.

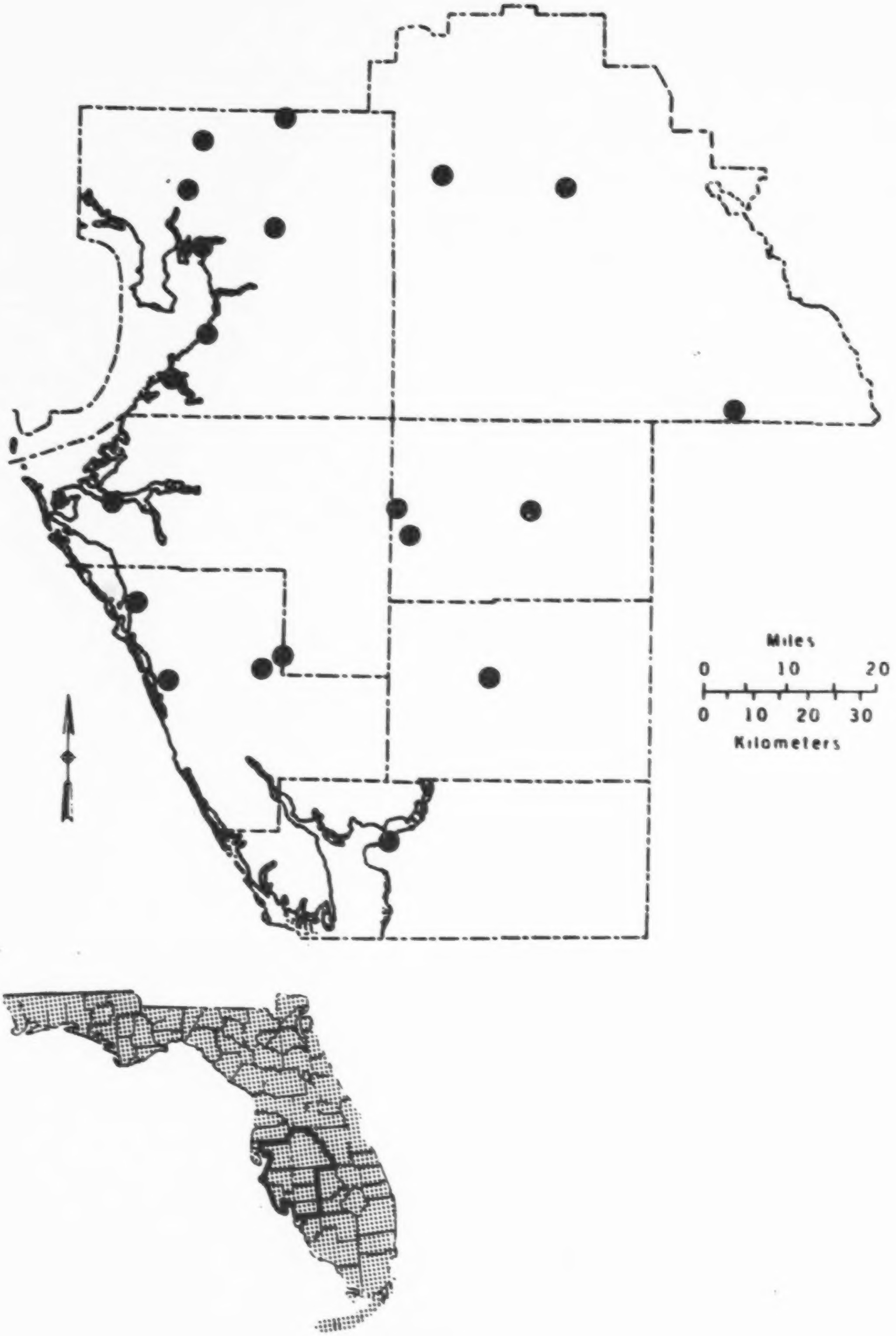

Miles
0
10
20
0
10
20
30
Kilometers

Fig. VIII.D.140. PURPLE MARTIN (Progne subis)

Listed - Threatened, Blue List

FLORIDA SCRUB JAY — *Aphelocoma coerulescens coerulescens* (Bosc)

Order Passeriformes — Family Corvidae

Distribution: The non-migratory Florida Scrub Jay has been recorded in the 1970's from isolated localities in all seven counties in the study area. Elsewhere in Florida, scrub jays are found at several localities in Highlands, Marion, and Lake counties, and in a narrow band along the Atlantic coastline. Several small, isolated colonies in a few other counties (*e.g.* near Cedar Key, Levy County) make up the entire range of the scrub jay in Florida (Westcott 1970). Numerous field observers have commented on the reduction in range of the Florida Scrub Jay during recent decades (J. B. Edscorn and S. Grimes pers. comm., Woolfenden 1976).

The Florida subspecies is morphologically (Pitelka 1951) and behaviorally (Woolfenden 1973, 1975) distinct from other populations of the species, which range over much of southwestern North America south into Mexico.

Habitat: The Florida Scrub Jay is extremely habitat specific, rarely occurring away from open sand pine scrub or scrubby flatwoods. Forested habitats and open grasslands and wetlands are avoided, although limited dispersal through other habitats must occur. Florida Scrub Jays nest in citrus groves, but apparently must have scrub nearby for other resources (Woolfenden 1973). Burning, which prevents scrub habitats from becoming densely forested, is essential to the existence of Florida Scrub Jay colonies.

Population Status: Florida Scrub Jays occupy large territories, therefore only a few families can live in small patches of scrub. An intensive population study in adjacent Highlands County at the Archbold Biological Station reveals that in an extensive tract of apparently optimum habitat, densities reach only 4 to 5 families per 100 acres (Woolfenden and Fitzpatrick unpubl. MS). Except immediately after breeding when the few fledglings of the last breeding season may be alive, Florida Scrub Jay families average only about three birds, consisting of a pair and one helper (Woolfenden 1975).

Basis for Priority Status: The Florida Scrub Jay is listed as Threatened by the Florida Game and Fresh Water Fish Commission and the Florida Committee on Rare and Endangered Plants and Animals and is on the 1977 Blue List of the National Audubon Society. Florida Scrub Jays are extremely habitat specific and their habitat is of high value to man. Scrub habitats were scarce in Florida prior to development, and man has since eliminated many acres by modifying them into suburbs, citrus groves, and improved pasture. In addition, scrub jays have been eliminated from some still extant scrub areas because of prevention of fires which are needed to maintain proper conditions for them.

Potential Impacts of Mining: The scrub habitats of Florida are few, scattered, and generally small, and many have been obliterated. Numerous organisms in addition to scrub jays are restricted to the scrub. Any mining activity that eliminates remaining stands of sand pine scrub would be detrimental to the status of the Florida Scrub Jay and the other characteristic species of this unique association. Using fine sand tailings and planting of scrub species, it might be feasible to reestablish sand pine scrub patches in reclaimed areas, which could be naturally recolonized or restocked with animal species typifying this environment.

Selected References:

*Pitelka, F. A. 1951. Speciation and ecological distribution in American jays of the genus Aphelocoma. Univ. Calif. Publ. Zool. 50:195-464.

*Westcott, P. J. 1970. Ecology and behavior of the Florida Scrub Jay. Ph.D. Thesis. Univ. of Fla., Gainesville, Florida. 82 pp.

*Woolfenden, G. E. 1973. Nesting and survival in a population of Florida Scrub Jays. Living Bird 12:25-49.

*Woolfenden, G. E. 1975. Florida Scrub Jay helpers at the nest. Auk 91(1):1-16.

*Woolfenden, G. E. 1976. Florida Scrub Jay, Pages 792-796 in Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

*Woolfenden, G. E., and J. W. Fitzpatrick. The inheritance of territory in group-breeding birds. Unpubl. MS.

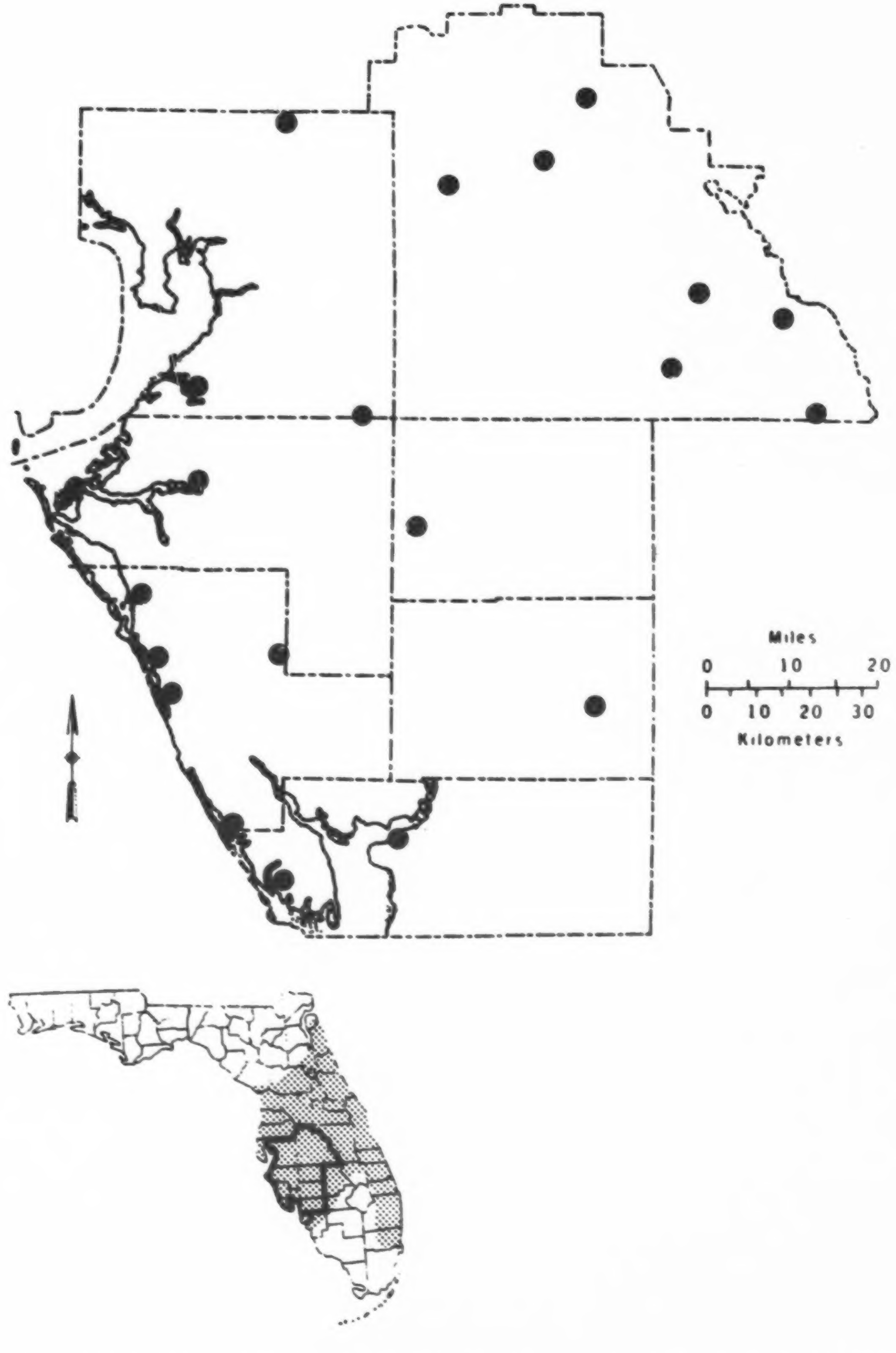

Miles
0
10
20
0
10
20
30
Kilometers

Fig. VIII.D.141. FLORIDA SCRUB JAY (Aphelocoma coerulescens coerulescens)

Listed - Species of Special Concern

WHITE-BREASTED NUTHATCH

Sitta carolinensis carolinensis Latham

Order Passeriformes

Family Sittidae

Distribution: The only records of this species from the seven-county area date from 1895 and 1896 in Polk County (USNM coll. nos. 151006 and 152006), 1921 in Manatee County (Evans 1923), and 1955 on the Myakka River State Park Christmas Bird Count. The species was once resident in northern peninsular Florida, but there are no recent breeding records and few records of any kind from the state (Robertson and Kushlan 1974). Elsewhere the White-breasted Nuthatch is resident from southern Canada south to the northern Gulf coast (Stevenson 1976).

Habitat: The White-breasted Nuthatch is an inhabitant of mature woodlands throughout its range, and in Florida apparently prefers large pine plantations.

Population Status: This bird, now rare in Florida, formerly was abundant over the northern half of the peninsula (Howell 1932).

Basis for Priority Status: The declining population in Florida, which corresponds, at least in part, to the clearing of mature pine woodlands, is the basis for designating this as a Species of Special Concern by the Florida Committee on Rare and Endangered Plants and Animals.

Potential Impacts of Mining: The species already is rare or absent from the seven-county area, perhaps because of logging, although this is not the opinion of Robertson and Kushlan (1974). There is no reason to suspect that mining and reclamation activities would have any impact on the species.

Selected References:

*Evans, L. I. 1923. An annotated list of birds observed in south Florida. Oologist 40:2-8.

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

*Robertson, W. B., Jr., and J. A. Kushlan. 1974. The southern Florida avifauna, Pages 414-452 in Gleason, P. J., ed., Environments of south Florida: present and past. Miami Geol. Soc. Memoir 2. 452 pp.

*Stevenson, H. M. 1976. Vertebrates of Florida, identification and distribution. Univ. Presses of Fla., Gainesville. 607 pp.

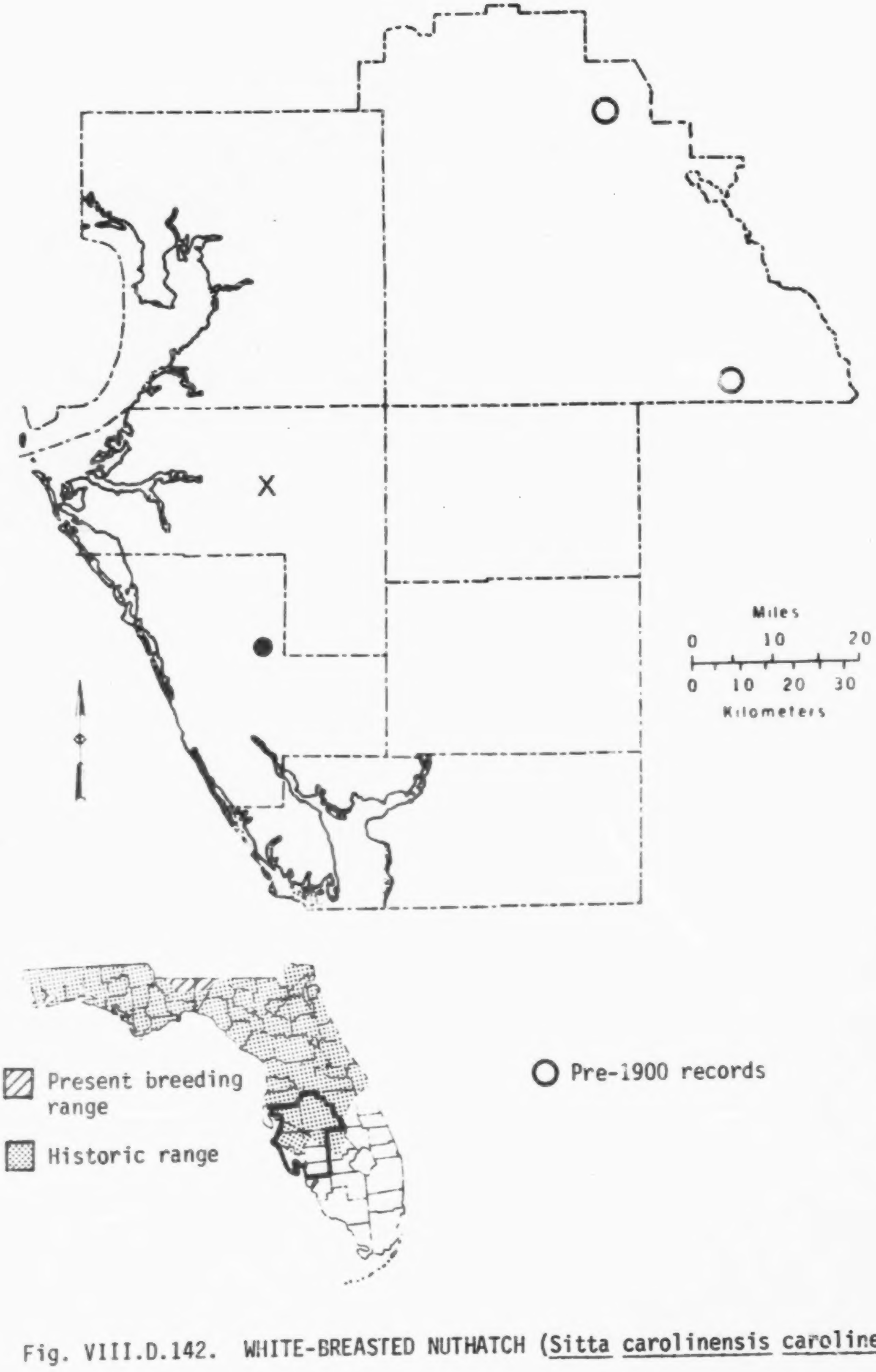

Miles
0
10
20
0
10
20
30
Kilometers
X
Present breeding range
Historic range
Pre-1900 records

Fig. VIII.D.142. WHITE-BREASTED NUTHATCH (*Sitta carolinensis carolinensis*)

Biologically Significant

BROWN-HEADED NUTHATCH

Sitta pusilla Latham

Order Passeriformes

Family Sittidae

Distribution: The Brown-headed Nuthatch is a resident breeder in the seven-county area, with records existing for all but DeSoto County. In Florida its range extends south to northern Monroe County and Fort Pierce, St. Lucie County (Stevenson 1976). The range as a whole extends from southeastern Oklahoma eastward through the Gulf coast states and along the Atlantic seaboard to southern Maryland and Delaware.

Habitat: Like the Red-cockaded Woodpecker and Bachman's Sparrow, this species restricts itself almost exclusively to the pine flatwoods of the state, using natural cavities for nesting.

Population Status: Few quantitative data on population status are available for this uncommon and very local species. Robertson and Kushlan (1974) report that it has disappeared from the southeastern part of the state, where once it was locally common. Although the species has never been as common in central and south Florida as in the panhandle (Howell 1932), its frequency apparently has declined in many localities. Van Duyn (1941) and Baynard (1942a) reported it an occasional resident in Myakka River State Park whereas in 1976 K. C. Alvarez (pers. comm.) considered it rare, with the latest sighting of the species being in 1962. Similarly, while Baynard (1942b) noted this nuthatch to be a common resident in Hillsborough River State Park, Stevenson (1967) lists no recent records. The disappearance of the species from the park may have been the result of clearing the pine flatwoods immediately adjacent to the park for pasture (G. E. Woolfenden pers. comm.).

The species does occur in the pine flatwoods in the nearby Lower Hillsborough Flood Detention Area (Woolfenden 1974). Breeding densities were estimated for a mature longleaf pine forest in Georgia to be 9.3 pairs per 100 acres (Norris 1951).

Basis for Priority Status: Its exclusive preference for pine flatwoods makes this species a valuable indicator of the condition of this association. Furthermore, the possibility that the species' decline in central Florida is related to habitat destruction deserves more attention than it has received.

Potential Impacts of Mining: Destruction of typical pine flatwoods stands by mining would reduce actual or potential habitat of this highly habitat specific bird. The types of environments created by current reclamation would be unsuitable. Even if attempts were made to reestablish pine lands that might be suitable for the species, it would take many years before they reached the proper stage.

Selected References:

*Baynard, O. E. 1942a. A check-list of birds Myakka River State Park. Fla. Forest and Park Serv., Sarasota, Florida. 15 pp.

*Baynard, O. E. 1942b. The birds of Hillsborough River State Park. Fla. Park Serv. 18 pp.

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

*Norris, R. A. 1951. Distribution and populations of summer birds in southwestern Georgia. Georgia Ornith. Soc., Occ. Publ. No. 3. 67 pp.

*Robertson, W. B., Jr., and J. A. Kushlan. 1974. The southern Florida avifauna, Pages 414-452 in Gleason, P. J., ed., Environments of south Florida: present and past. Miami Geol. Soc. Memoir 2. 452 pp.

*Stevenson, H. M. 1976. Vertebrates of Florida, identification and distribution. Univ. Presses of Fla., Gainesville. 607 pp.

*Stevenson, J. A. 1967. A list of the vertebrates identified in Hillsborough River State Park. Fla. Brd. of Parks. 16 pp.

*Van Duyn, G. 1941. Progress report of biological reconnaissance Myakka River State Park, Florida (FLA SP-4) with preliminary checklists of vertebrate fauna. 25 pp.

*Woolfenden, G. E. 1974. Bird habitat distribution and population estimates, Pages 54-66 *in* Cowell, B. C., *et al*., Biological assessment of the Lower Hillsborough Flood Detention Area for recommendation of ecologically based land management. Univ. of So. Fla., Tampa. 111 pp.

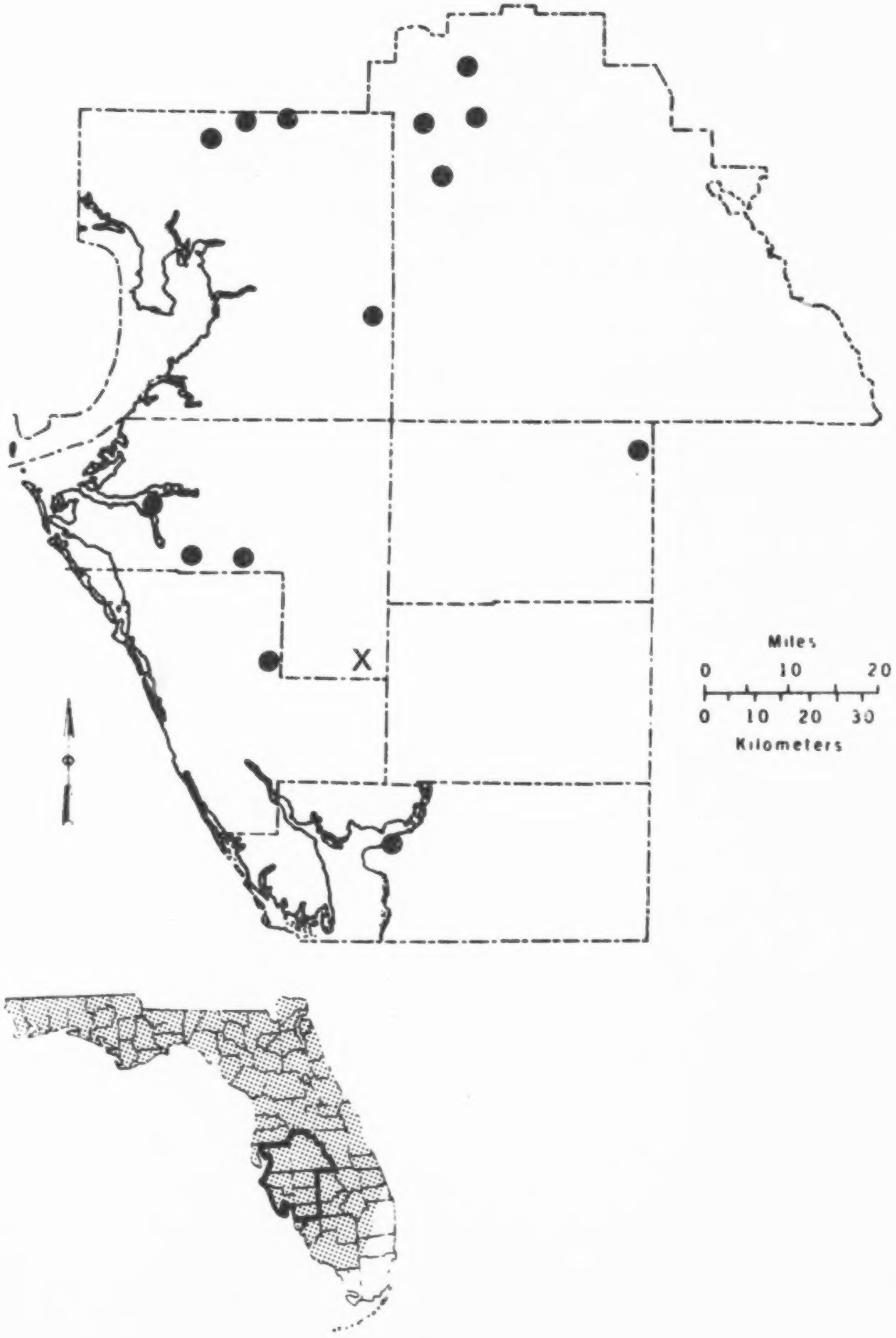

X
Miles
0
10
20
0
10
20
30
Kilometers

Fig. VIII.D.143. BROWN-HEADED NUTHATCH (Sitta pusilla)

Listed - Blue List

BEWICK'S WREN Thryomanes bewickii (Audubon)

Order Passeriformes Family Troglodytidae

Distribution: At present this wren is an occasional winter visitor to northwestern Florida, with earlier records (Sprunt 1954) for central Florida (Highlands County). Baynard (1942) reported it at Hillsborough River State Park, but no recent records from the seven-county area exist. The species breeds from southwestern British Columbia southward to Baja California and southern Mexico and eastward across the central United States to central Georgia and South Carolina. Eastern populations winter farther south, some reaching the coast, September to March. An inhabitant of thickets, this wren is becoming scarcer in Florida (Stevenson 1976) as in other parts of its eastern range, which is the basis of its inclusion on the 1977 Blue List of the National Audubon Society.

Selected References:

*Baynard, O. E. 1942. The birds of Hillsborough River State Park. Fla. Park Service. 18 pp.

*Sprunt, A., Jr. 1954. Florida bird life. Coward-McCann, Inc., New York. 527 pp.

*Stevenson, H. M. 1976. Vertebrates of Florida, identification and distribution. Univ. Presses of Fla., Gainesville. 607 pp.

Listed - Species of Special Concern

MARIAN'S LONG-BILLED MARSH WREN *Cistothorus palustris marianae* (Scott)

Order Passeriformes Family Troglodytidae

Distribution: Marian's Long-billed Marsh Wren breeds from Charlotte County north along the Gulf coast to Alabama. Other races of the species breed throughout much of the United States and southern Canada. Though still known to breed at scattered localities from Pasco County northward, no recent records exist for the seven-county area. The last records were in 1908 in Manatee County and in 1923 in Charlotte County (Wheeler 1931).

Habitat: This species is restricted to brackish or saltwater marshes within the estuaries of rivers and along the coast. It nests in extensive areas of Black Rush, *Juncus roemerianus*, from April through July.

Population Status: No recent records from the seven-county area exist for this race.

Basis for Priority Status: Marian's Long-billed Marsh Wren is listed as a Species of Special Concern by the Florida Committee on Rare and Endangered Plants and Animals because its habitat is being threatened by dredging and filling of the Gulf coastal marshes.

Potential Impacts of Mining: Any activities directly or indirectly linked to mining which disturb large areas of coastal marsh would further minimize the probability of survival of this race, if still present, in the seven-county area.

Selected References:

Kale, H. W., II. 1976. Marian's Marsh Wren, Pages 921-924 *in* Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

*Wheeler, H. E. 1931. The status, breeding range, and habits of Marian's Marsh Wren. Wilson Bull. 43(4):247-267.

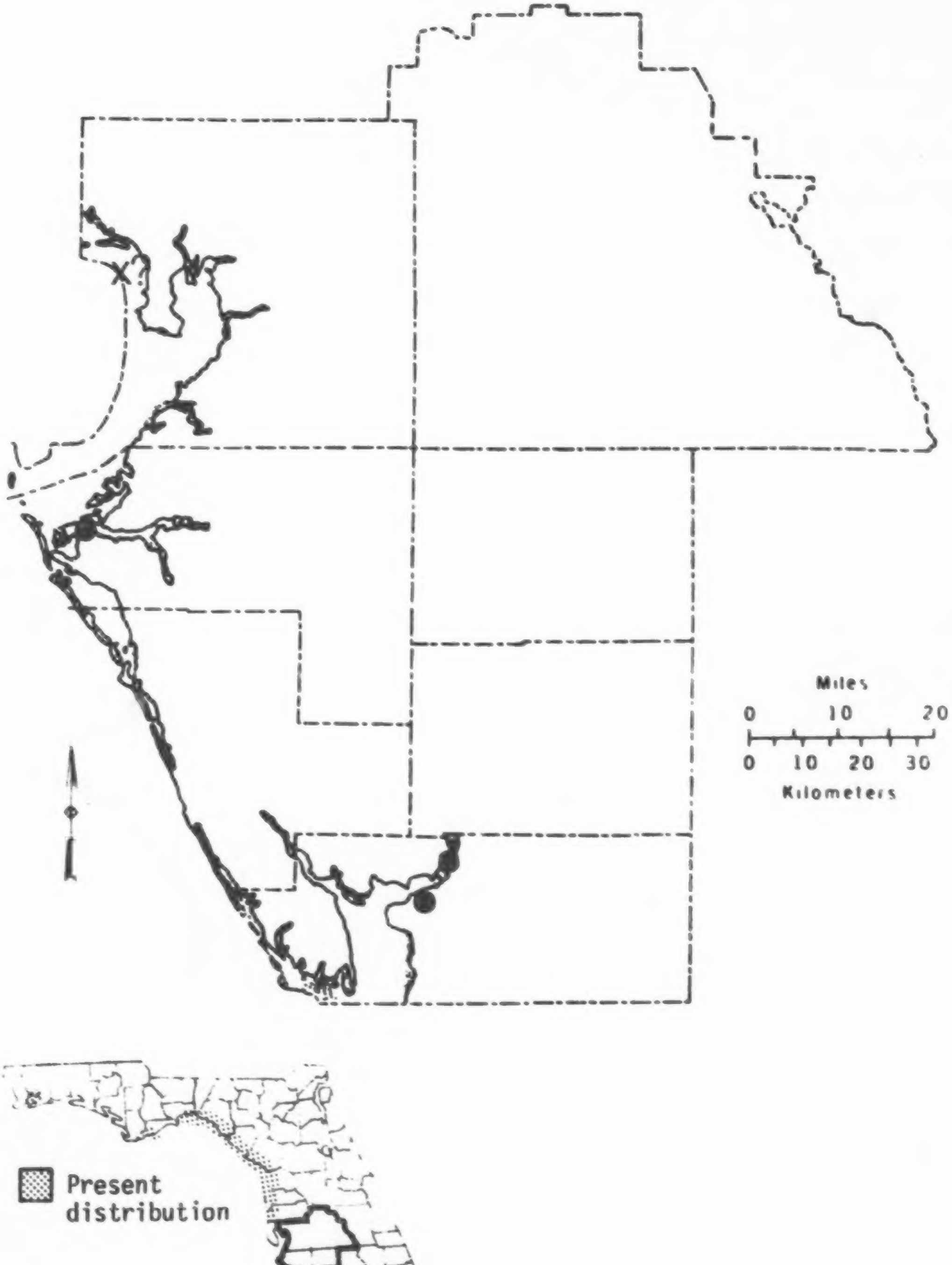

Miles
0
10
20
0
10
20
30
Kilometers
▩ Present distribution

Fig. VIII.D.144. MARIAN'S LONG-BILLED MARSH WREN (*Cistothorus palustris marianae*)

Biologically Significant

EASTERN BLUEBIRD — *Sialia sialis* (Linnaeus)

Order Passeriformes — Family Turdidae

Distribution: The Eastern Bluebird is a permanent resident in the seven-county area. Formerly resident throughout the state (Howell 1932), the species has been extirpated from southeastern Florida (Robertson and Kushlan 1974), including Miami which is the type locality for the Florida race *S. s. grata*. The nominate race *S. s. sialis* intergrades with the Florida bluebird in a broad belt across the peninsula through Lake County (Howell 1932). The nominate race, northern populations of which are migratory, breeds throughout the eastern United States and southeastern Canada.

Habitat: The Eastern Bluebird has rather narrow habitat preferences. Commonest in open pine flatwoods, it also will reside in open dry cypress forests and pastureland that includes some dead trees or old posts that provide the cavities used as nest sites. Fifteen of 26 habitat records for bluebirds in the study area are from pine flatwoods, ten from pastures, and one from a cypress strand. Bluebirds probably were a common constituent of the longleaf pine forests that once covered significant portions of Hillsborough and Polk counties. This habitat has been essentially eliminated by humans. Thus, Eastern Bluebirds are scarce on the Lake Wales Ridge. They also are scarce near the coast. The preponderance of recent records is from the interior flatlands area.

Population Status: The Eastern Bluebird is a common permanent resident in the seven-county area, a status that seems best supported by the Breeding Bird Surveys (Table VIII.D.7). However, its rather narrow habitat tolerances result in the species being absent or nearly so from numerous regions, especially on the Ridge in the northeastern parts of the seven counties and near the Gulf coast. Of the seven Christmas Bird Counts taken in the seven-county area, three are on the Gulf coast, and one is on the Ridge. These four and the Lakeland (Polk County) counts record few bluebirds (Table VIII.D.5). The Myakka River State Park and Tampa counts include more open flatwoods and uncleared pastures, and record more bluebirds.

The analysis of long-term trends in winter populations (Table VIII.D.6) clearly indicates the Eastern Bluebird has decreased during the last 11 years in the areas covered by four Christmas Bird Counts. Support for this conclusion comes from Myakka River State Park where bluebirds were considered common residents through the 1930's (Van Duyn 1941), but now are uncommon (K. C. Alvarez pers. comm.). In addition, the species appears to be entirely gone from southeastern Florida (Robertson and Kushlan 1974) just south of the study area. Identifying causes for the decline is difficult. For bluebird populations throughout North America, three reasons often are mentioned: 1) loss of acceptable habitat, 2) unsuccessful competition with the exotic Starling (Sturnus vulgaris), and 3) abnormally cold winters within the winter range. Cold weather seems the least likely hypothesis to explain decreases in Florida. Loss of habitat is discounted for the southeastern Florida population (Robertson and Kushlan 1974). Although Starlings seem more abundant around Tampa than elsewhere in the seven-county area (Table VIII.D.5), they did not interfere with nesting in unimproved pasture habitat in that region (White and Woolfenden 1973).

Basis for Priority Status: The Eastern Bluebird is classified as biologically significant because of the apparent decline of its populations in peninsular Florida in recent years and its relatively narrow habitat tolerance which makes it a useful indicator of environmental change. In addition, its habits facilitate accurate population censuses.

Potential Impacts of Mining: The Eastern Bluebird is an inland bird requiring open flatwoods or pasturelands with suitable nest sites. Major alteration of these habitats by mining will have a major impact upon the status of the species in the seven-county area. Some of the best occupied habitats are in areas already slated for mining. Provision of artificial nest boxes in connection with suitable open habitats as part of reclamation would probably aid in reducing the long-term impact of mining on the species.

Selected References:

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

*Robertson, W. B., Jr., and J. A. Kushlan. 1974. The southern Florida avifauna, Pages 414-452 in Gleason, P. J., ed., Environments of south Florida: present and past. Miami Geol. Soc. Memoir 2. 452 pp.

*Van Duyn, G. 1941. Progress report of biological reconnaissance Myakka River State Park, Florida (FLA SP-4) with preliminary checklists of vertebrate fauna. 25 pp.

*White, S. C., and G. E. Woolfenden. 1973. Breeding of the Eastern Bluebird in central Florida. Bird-Banding 44:110-123.

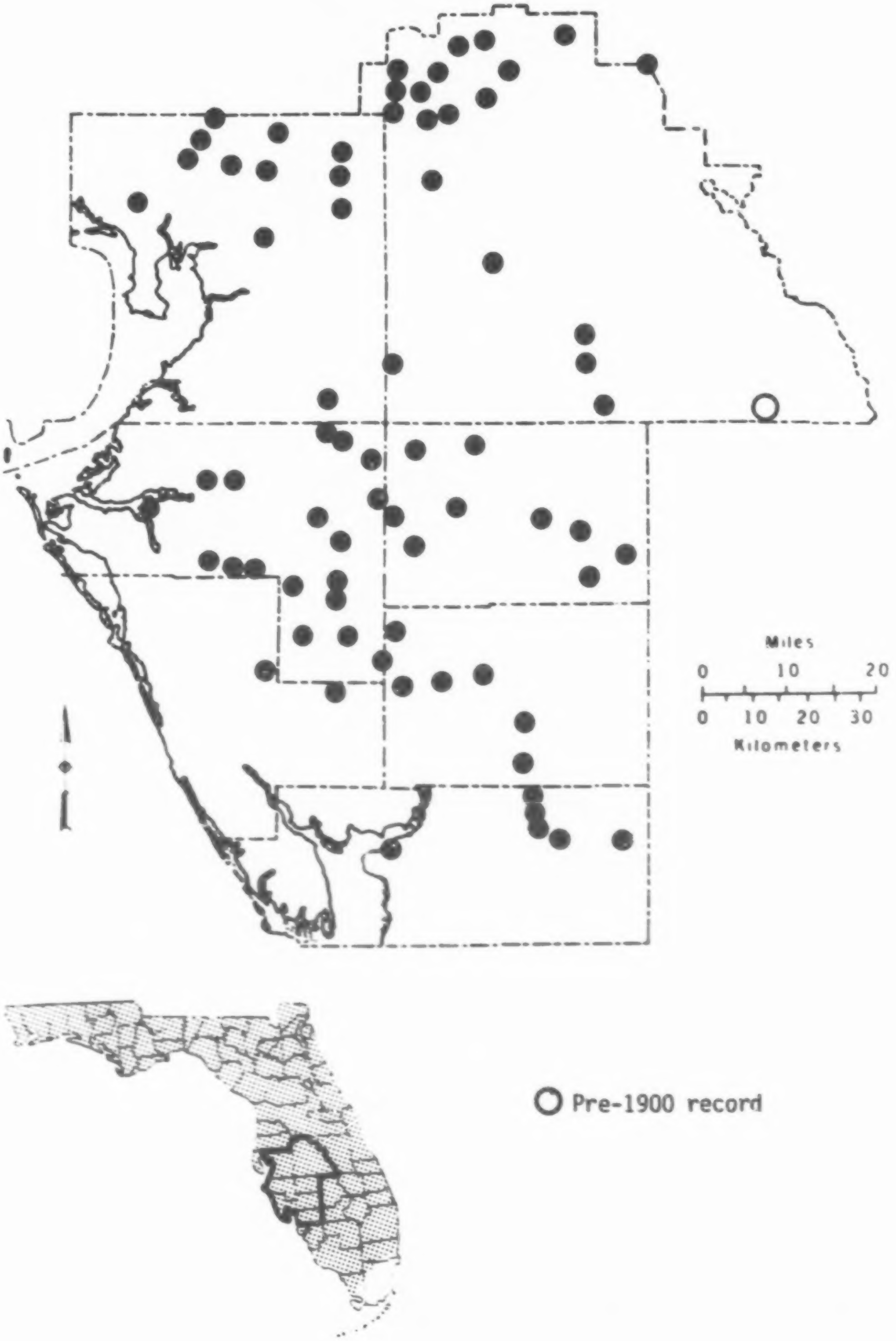

Miles
0 10 20
0 10 20 30
Kilometers
○ Pre-1900 record

Fig. VIII.D.145. EASTERN BLUEBIRD (*Sialia sialis*)

Biologically Significant

LOGGERHEAD SHRIKE *Lanius ludovicianus* Linnaeus

Order Passeriformes Family Laniidae

Other Names: Butcherbird

Distribution: The Loggerhead Shrike is generally distributed throughout the seven-county area. Its breeding range includes all of the Florida mainland and north through much of the conterminous United States and into southern Canada. In winter it withdraws from the northern parts of its range and is occasionally seen on the Florida Keys (Stevenson 1976).

Habitat: This is a bird of open country, frequenting native prairies and improved pastures, cultivated lands and old fields, as well as open pine flatwoods, forest edge communities, and brushy vegetation interspersed with open areas. It often occurs in developed areas with open land around. In past decades the shrike may have restricted itself more to open flatwoods and prairie edges, but with large-scale opening of forest land, it has expanded its local range. In these open areas, however, the species requires elevated perches from which to forage. It is often abundant along roads with grassy shoulders and poles to perch on.

Population Status: In Florida, as in the southern coastal plains and western prairies, the shrike is a common bird. However, it is uncommon to rare in the northeastern and central United States, in part because of lack of suitable habitat. Data from Christmas Bird Counts (Table VIII.D.5) show the species' preference for ruderal, well-drained farmland areas, such as Lake Wales, over urban, suburban, and coastal lowland areas. Lack of open grassland habitat probably accounts for the relative paucity of shrikes at

Myakka River State Park. Table VIII.D.11 shows little difference in the number of shrikes seen per 10 party hours for the Tampa Summer and Christmas Bird Counts, suggesting that virtually all shrikes found in the study area are permanent residents.

Shrikes are common along Breeding Bird Survey routes (Table VIII.D.7), which primarily encompass open pasturelands. The Archbold Biological Station Roadside Census indicates more shrikes seen in DeSoto and Hardee counties than in Charlotte County (Table VIII.D.9), suggesting that the wetter habitat along the census route in Charlotte County is less desireable habitat for shrikes than the well-drained pastureland in DeSoto and Hardee counties. The increase of shrikes seen on both summer and winter Roadside Censuses from 1974 to 1976 (Table VIII.D.10) cannot be adequately explained, though increased reproductive success may be a factor.

F. E. Lohrer (pers. comm.) studied shrikes nesting on the campus of the University of South Florida, Tampa, in 1971 and 1972. In seemingly optimal habitat consisting of open grassland with scattered live oaks and slash pines, breeding density was 18 pairs per 100 acres for both years. Robertson's (1955) study in a young second-growth rockland pine forest on Long Pine Key, Dade County, which is sub-optimal shrike habitat, revealed only 4 pairs per 100 acres.

Basis for Priority Status: The Loggerhead Shrike is biologically significant because as an insectivorous and carnivorous species it is sensitive to changes in animal populations lower on the food chain. Like other insectivorous species, it can be affected by pesticide poisoning. Furthermore, as a territorial bird and one that requires open areas for foraging, it is sensitive to changes in land use. For example, shrikes were once abundant in certain ruderal areas on the outskirts of Tampa but development and the expansion of suburbs have decreased their numbers (F. E. Lohrer pers. comm.).

Potential Impacts of Mining: As shrikes can use a variety of intermediate successional stages between barren lands and forests, it is unlikely that the species will be significantly affected by mining. Grasslands and other open habitats created by reclamation should provide suitable shrike habitat.

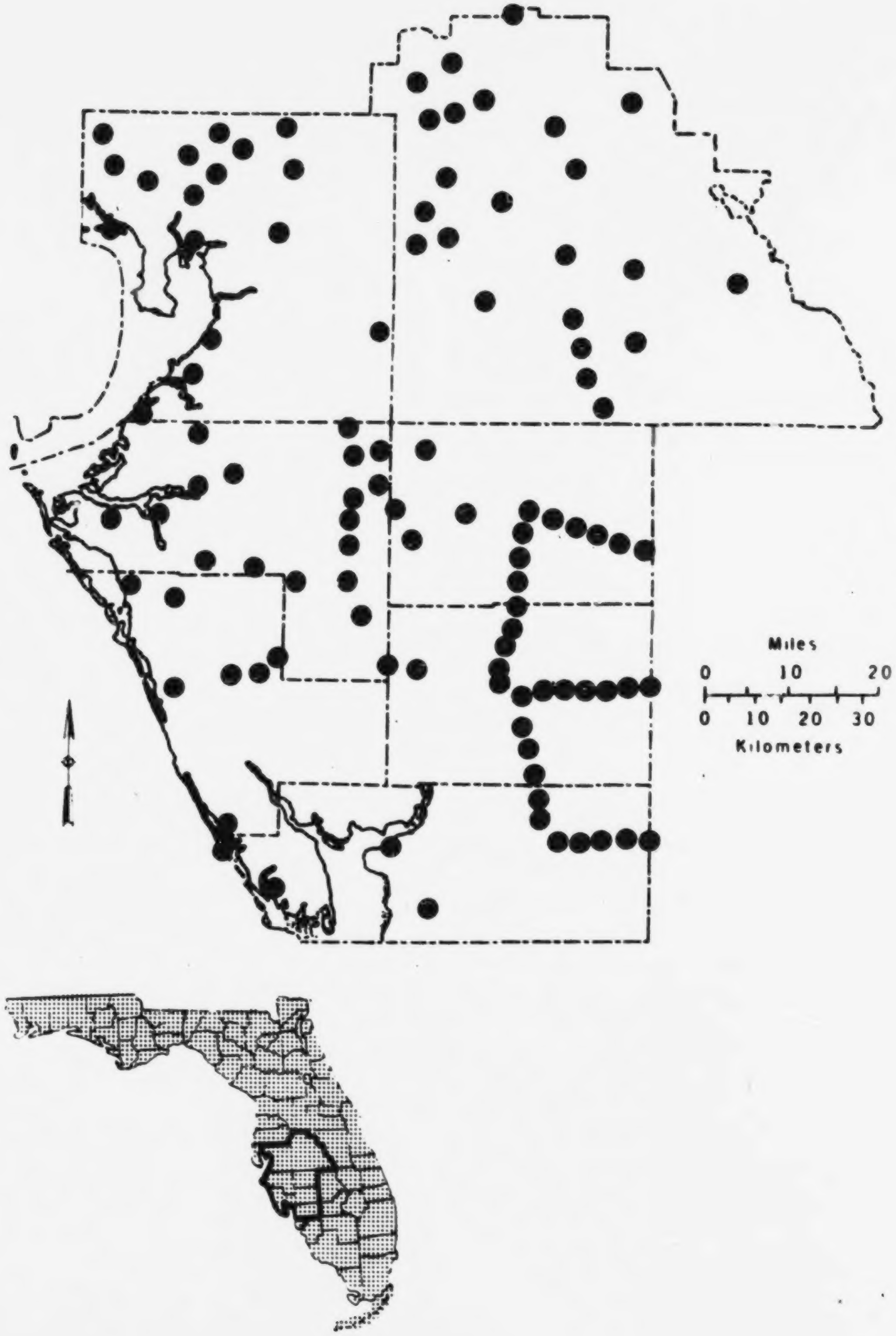
Selected References:

Bent, A. C. 1950. Life histories of North American wagtails, shrikes, vireos, and their allies. U. S. Nat. Mus. Bull. 197. 411 pp.

Miller, A. H. 1931. Systematic revision and natural history of the American Shrikes (Lanius). Univ. of Calif. Publ. Zool. 38(2):11-242.

*Robertson, W. B. 1955. An analysis of the breeding-bird populations of tropical Florida in relation to the vegetation. Ph.D. Thesis. Univ. of Ill., Urbana.

*Stevenson, H. M. 1976. Vertebrates of Florida, identification and distribution. Univ. Presses of Fla., Gainesville. 607 pp.


Miles
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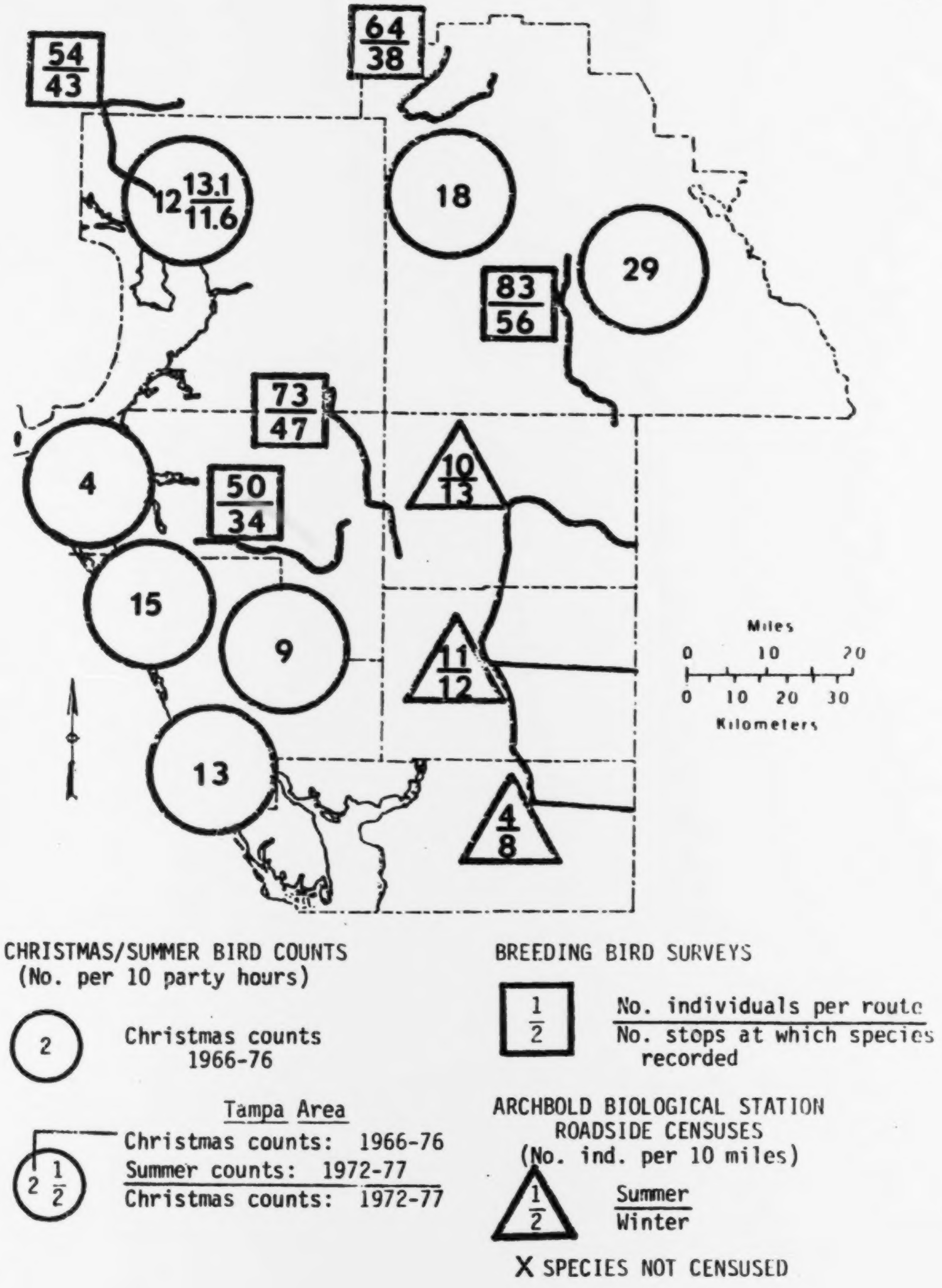
Kilometers

Fig. VIII.D.146. LOGGERHEAD SHRIKE (Lanius ludovicianus)


54/43
64/38
12 13.1/11.6
18
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83/56
73/47
4
50/34
10/13
15
9
11/12
13
4/8
Miles
0 10 20
0 10 20 30
Kilometers
CHRISTMAS/SUMMER BIRD COUNTS
(No. per 10 party hours)
2 Christmas counts 1966-76
Tampa Area
2 1/2 Christmas counts: 1966-76
Summer counts: 1972-77
Christmas counts: 1972-77
BREEDING BIRD SURVEYS
1/2 No. individuals per route
No. stops at which species recorded
ARCHBOLD BIOLOGICAL STATION ROADSIDE CENSUSES
(No. ind. per 10 miles)
1/2 Summer
Winter
X SPECIES NOT CENSUSED

Fig. VIII.D.147. LOGGERHEAD SHRIKE (*Lanius ludovicianus*). Population data.

Biologically Significant

STARLING — *Sturnus vulgaris* Linnaeus

Order Passeriformes — Family Sturnidae

Distribution: Introduced into the eastern United States in the late 1800's, the Starling now lives in all of the counties in the study area, throughout the remainder of Florida, and all of the conterminous United States and southern Canada (Robbins *et al*. 1966). Records of first appearance (1918) and first nesting (1932) in Florida are from north of the study area (Sprunt 1954). First nesting in the seven counties seems to have been in Tampa in 1943 (Nicholson 1964). Dispersal through the seven-county area occurred in the 1940's to 1960's (Sprunt 1954, 1963).

Habitat: The Starling is closely associated with man, and increases in numbers as man alters natural habitats. Starlings forage in open areas such as lawns, crop fields, livestock pens, and city streets, and roost in tall trees or high up on man-made structures. They are cavity nesters. Starlings often occupy crevices in buildings or tree cavities where they compete with native birds such as woodpeckers and bluebirds. On a number of occasions field biologists have witnessed the physical eviction of various native species from their cavities by Starlings (*e.g*. Woolfenden and Rohwer 1969a, p. 21). Starlings readily use artificial nest boxes. Christmas Bird Counts in the seven-county area (Fig. VIII.D.5) reflect the habitat preferences of Starlings. The species is scarcest in Myakka River State Park, which is dominated by natural habitats, and most abundant in the Tampa and Lakeland areas with their extensive man-altered habitats. The coastal counts generally show lower numbers. It may be that the dominant sandy substrate along the beaches is unsuitable for the ground probing foraging characteristic of Starlings.

Population Status: The Starling is abundant in the seven-county area, summer and winter, as revealed by the Christmas Bird Counts, Tampa Summer Bird Count, and the Breeding Bird Surveys (Tables VIII.D.5, 7, 11). In 1963 relative densities of Starlings were estimated using a strip-census method in two suburban habitats in the study area: Bradenton, Manatee County (4.9 birds/mile) and Tampa, Hillsborough County (12.9 birds/mile). Starlings constituted only 3 percent and 8 percent of the birds seen at these localities (Woolfenden and Rohwer 1969b). Densities per unit area are available for adjacent Pinellas County, where about 2 to 3 pairs of Starlings per 100 acres occur in the major suburban habitat types. Starlings occur in much greater densities in the northern United States and a continuing increase locally is predicted (Woolfenden and Rohwer 1969a).

The appearance and increase in numbers of the Starling is dramatically documented for one locality in the study area. In the Sarasota area, no Starlings were recorded on the 1953 and 1954 Christmas Bird Counts; 30 were seen on the 1955 count, and the species has been recorded annually ever since, with a general trend toward increasing numbers. In excess of 600 birds have been recorded on Sarasota counts since 1969-70. Unfortunately no other Christmas Bird Counts from within the study area that include suburban habitat were begun early enough to chronicle the Starling's history. The history of the Starling in the seven-county area, as shown by the Sarasota count, is paralleled by its history in St. Petersburg, Pinellas County (Woolfenden and Rohwer 1969a).

Basis for Priority Status: The Starling is classed as biologically significant on the basis of its value as an indicator of man's effect on the natural environments of all Florida, including the seven-county area. Unfortunately pre-Starling era baseline data are few, but a good monitering program begun now would aid in anticipating future impacts of Starling populations on native bird species and detecting other deleterious effects of man's activities on natural ecosystems.

Potential Impacts of Mining: A direct effect on the Starling by mining activities seems improbable. General clearing and development will increase Starling habitat which should stimulate further spread and population increase.

Selected References:

*Nicholson, D. J. 1964. Earliest Starling (Sturnus vulgaris) breeding record for Tampa. Fla. Nat. 37(3):91.

*Robbins, C. S., B. Bruun, and H. S. Zim. 1966. Birds of North America. Golden Press, New York. 340 pp.

*Sprunt, A., Jr. 1954. Florida bird life. Coward-McCann, Inc., New York. 527 pp.

*Sprunt, A., Jr. 1963. Addendum to Florida bird life. Coward-McCann, Inc., New York. 21 pp.

*Woolfenden, G. E., and S. A. Rohwer. 1969a. Relative abundance of bird populations in residential districts of the Tampa Bay area. Fla. St. Brd. of Health Monogr., No. 12:110-117.

*Woolfenden, G. E., and S. A. Rohwer. 1969b. Breeding birds in a Florida suburb. Bull. Fla. St. Mus. 13(1):1-83.

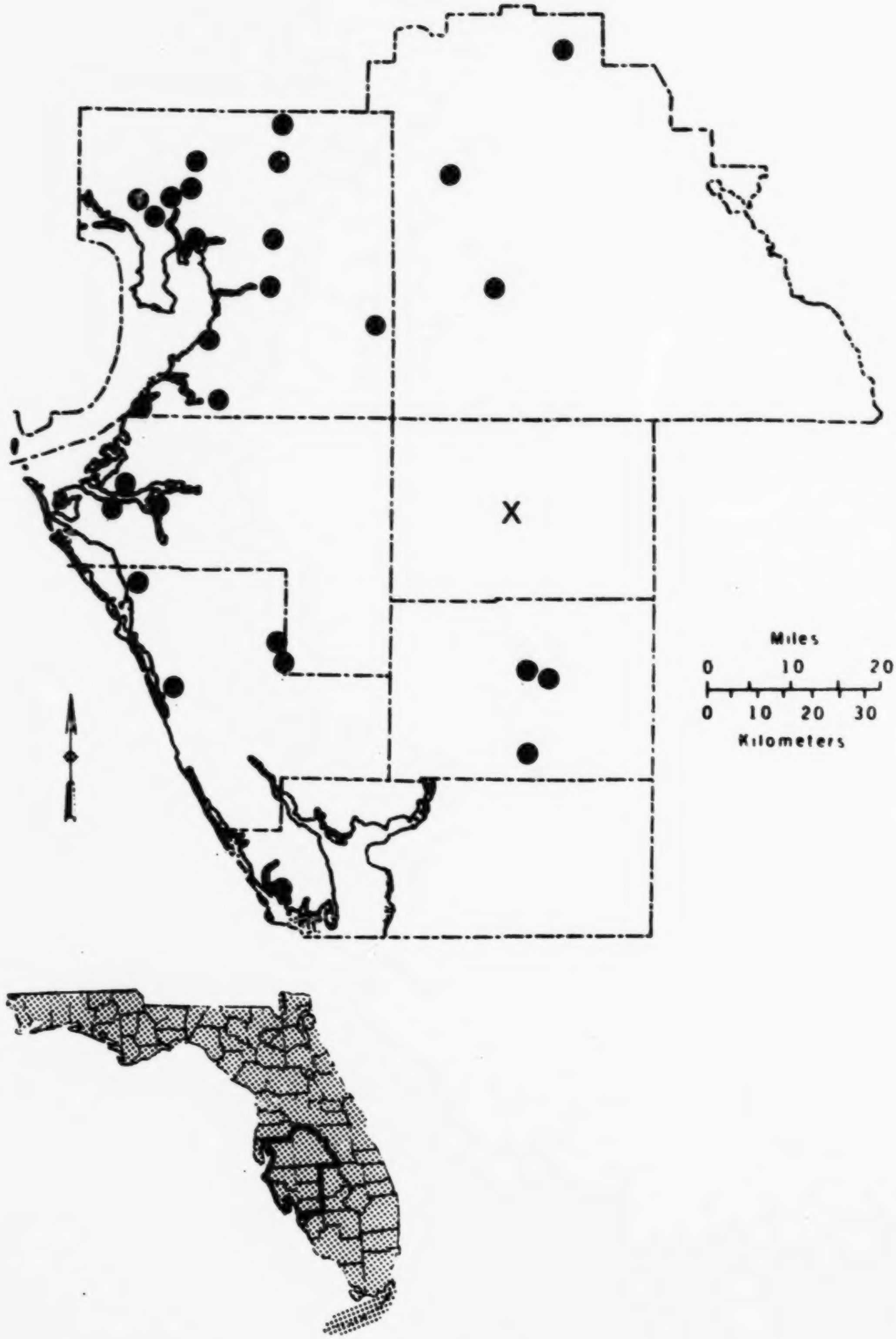
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Fig. VIII.D.148. STARLING (Sturnus vulgaris)

Listed - Blue List

BELL'S VIREO *Vireo bellii* Audubon

Order Passeriformes Family Vireonidae

Distribution: Bell's Vireo has been recorded once from the study area: Polk County, Lakeland, 5 February 1977 (Edscorn 1977). It was not known to occur in Florida when Sprunt (1954) updated Howell (1932). Later Sprunt (1963) listed the species as a regular fall visitor to the state and cited records from Dade, Franklin and Monroe counties. A specimen has also been collected in Citrus County (Univ. So. Fla. Bird Coll. no. 3474).

Breeding in midwestern and southwestern North America, most individuals of this species migrate south for winter through Mexico (Robbins *et al.* 1966).

Habitat: Bell's Vireo resides in moist thickets and woodland margins, and in the southwest in mesquite.

Population Status: This species is extremely rare in Florida.

Basis for Priority Status: Bell's Vireo is on the 1977 Blue List of the National Audubon Society on the basis of evidence of a substantial reduction in its population.

Potential Impacts of Mining: Loss of forest edge as a result of mining would reduce potential habitats of Bell's Vireo and thus diminish the probability of the species becoming a more common inhabitant of Florida.

Selected References:

*Edscorn, J. B. 1977. Florida birds. Fla. Nat. 50(2):30-31.

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc. New York. 579 pp.

*Robbins, C. S., B. Brunn, and H. S. Zim. 1966. Birds of North

America. Golden Press, New York. 340 pp.

*Sprunt, A., Jr. 1954. Florida bird life. Coward-McCann, Inc., New York. 527 pp.

*Sprunt, A., Jr. 1963. Addendum to Florida bird life. Coward-McCann, Inc., New York. 21 pp.

Listed - Rare

BLACK-WHISKERED VIREO   *Vireo altiloquus* (Vieillot)

Order Passeriformes   Family Vireonidae

Distribution: The Black-whiskered Vireo is a summer resident along the Gulf coast of the seven-county area, with records from Charlotte, Hillsborough, Manatee, and Sarasota counties. In all probability this vireo is an invader from the West Indies. It occurs along the coast and inland in southern Florida (Robertson and Kushlan 1974), but only coastally elsewhere in the state. It ranges north to Volusia County on the Atlantic coast and Levy County along the Gulf coast (Anon. 1976). Recently the species has spread to the panhandle of Florida and to the Gulf coasts of Alabama, Louisiana and Texas (Duncan 1976). The Black-whiskered Vireo is present in Florida from March through summer and migrates to the tropics for winter.

Habitat: The Black-whiskered Vireo is extremely habitat specific in the seven-county area, being restricted to coastal mangrove and nearby coastal live oaks. In southern Florida the species is much more widespread, living inland in hardwood hammocks and suburban forest edge (Robertson and Kushlan 1974). Individuals found in the panhandle, though not known to nest, occur in coastal live oaks (Duncan 1976). The probability that Black-whiskered Vireos in the study area will invade additional habitats seems good.

Population Status: The Black-whiskered Vireo is an uncommon summer resident of mangroves in the study area. Elsewhere in the seven-county area it is accidental. Density estimates are available for two localities in southern Florida. In mature tropical hammock, 11 singing males per 100 acres were estimated in an 18-acre plot on Lignumvitae Key (Monroe County); and in a disturbed tropical hammock, 3 singing males per 100 acres were estimated in a 30-acre plot on Big Pine Key (Monroe County) by Robertson (1955). Unfortunately the density of the species in coastal mangrove north of southern Florida has not been measured.

Basis for Priority Status: The Black-whiskered Vireo is listed as Rare by the Florida Committee on Rare and Endangered Plants and Animals.

Potential Impacts of Mining: Any activities associated with mining resulting in reduction of coastal mangrove or coastal live oak hammocks will reduce the habitat available for this species.

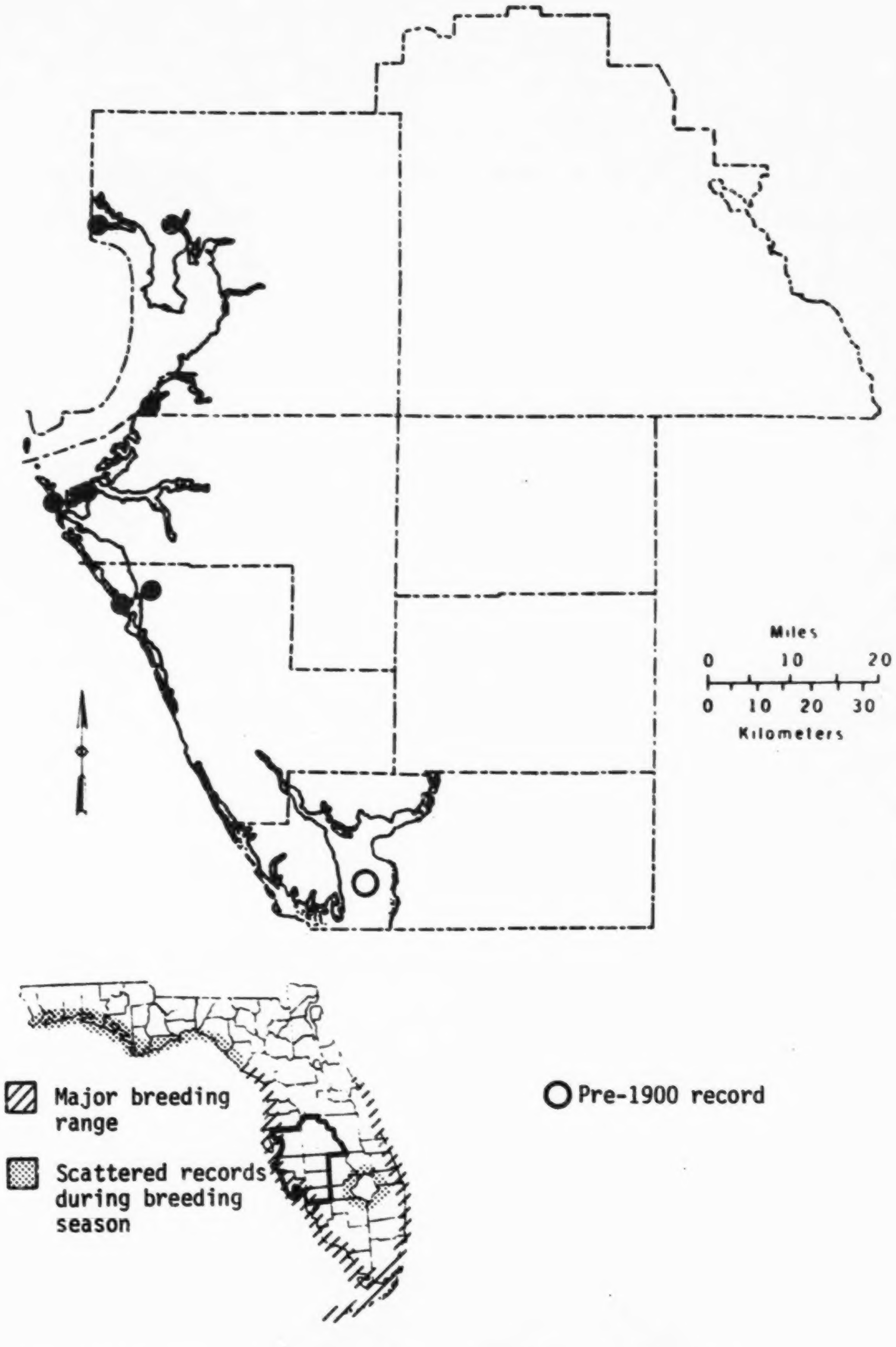
Selected References:

*Anon. 1976. Black-whiskered Vireo, Pages 834-837 in Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

*Duncan, R. A. 1976. The Black-whiskered Vireo: a summary of its status on the northern Gulf coast. Am. Birds 30(6):658-660.

*Robertson, W. B., Jr. 1955. An analysis of the breeding-bird populations of tropical Florida in relation to the vegetation. Ph.D. Thesis. Univ. of Ill., Urbana.

*Robertson, W. B., Jr., and J. A. Kushlan. 1974. The southern Florida avifauna, Pages 414-452 in Gleason, P. J., ed., Environments of south Florida: present and past. Miami Geol. Soc. Memoir 2. 452 pp.


Miles
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Kilometers
Major breeding range
Scattered records during breeding season
Pre-1900 record

Fig. VIII.D.149. BLACK-WHISKERED VIREO (*Vireo* *a.tiloquus*)

Listed - Species of Special Concern

WORM-EATING WARBLER *Helmitheros vermivorus* (Gmelin)

Order Passeriformes Family Parulidae

Distribution: This warbler has been recorded as a migrant in Hillsborough, Manatee, Polk, and Sarasota counties. It breeds in northwestern Florida (Stevenson 1961, 1962) and occasionally winters in southern Florida; otherwise it is known in the state only as a migrant from late March to early May and from August to October. Elsewhere it breeds from northeastern Kansas east to North Carolina, north to southeastern New York and western Massachusetts, and south through most of Alabama. In winter it is found from southeastern Mexico and the Bahama Islands southward to Panama.

Habitat: The Worm-eating Warbler prefers the steep slopes of deciduous woodlands and undergrowth in the breeding season, but in migration is found in a greater variety of wooded or thicketed areas (Stevenson 1976).

Population Status: In the seven-county area this warbler is a rare transient, though some years in spring a front may blow in numbers along the Gulf coast.

Basis for Priority Status: This taxon is listed as a Species of Special Concern by the Florida Committee on Rare and Endangered Plants and Animals because of only two known breeding localities in Florida, both recent enough to suggest that the breeding range may be expanding southward (Stevenson 1976). Its status should be monitered.

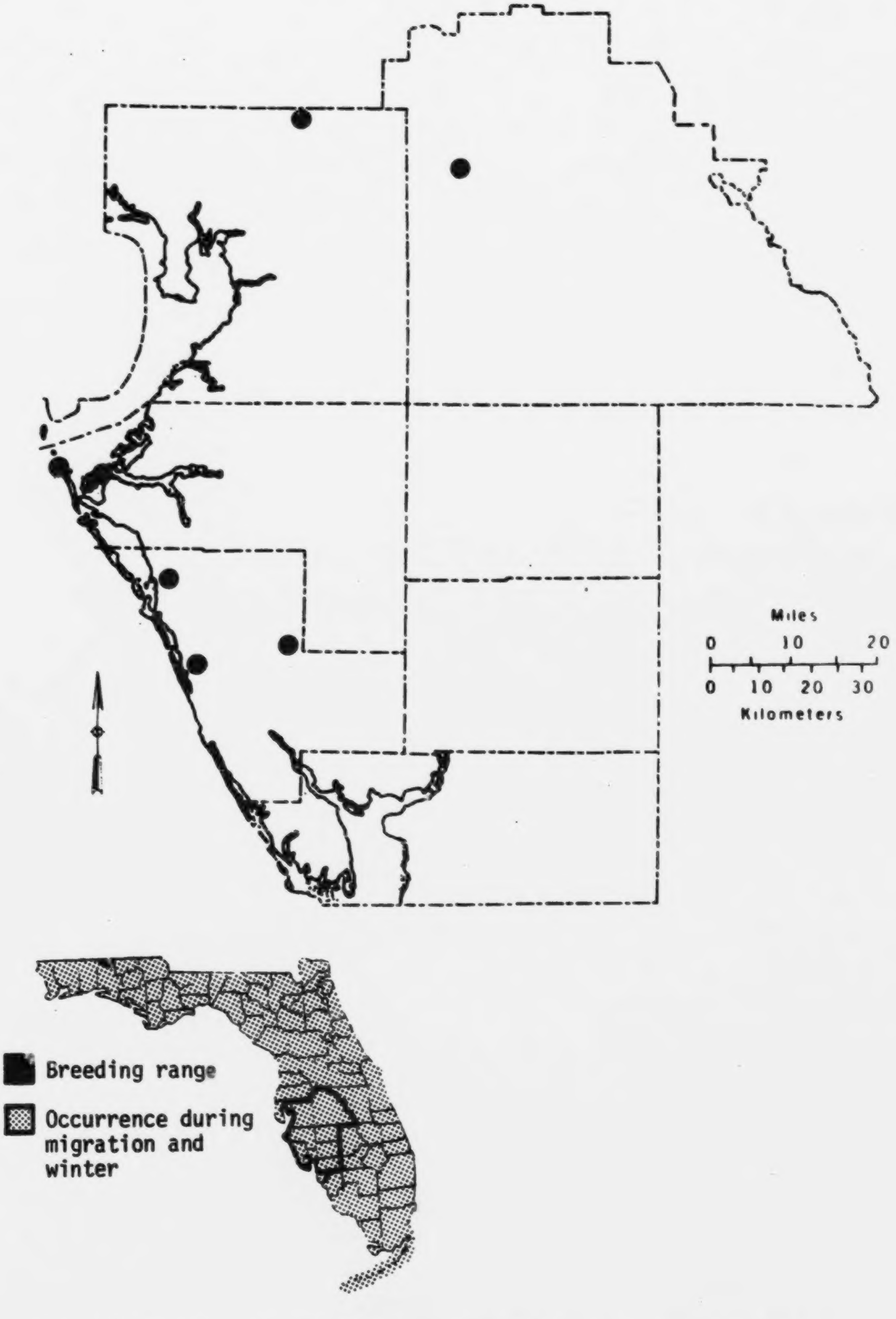
Potential Impacts of Mining: As a rare migrant in the seven-county area, the species probably will not be affected by phosphate mining to any significant degree. However, extensive removal of forest or woodland vegetation could presumably reduce the migrant population through the region.

Selected References:

*Stevenson, H. M. 1961. Possible breeding of the Worm-eating Warbler in Florida. Fla. Nat. 34(4):222-223.

*Stevenson, H. M. 1962. Evidence of the breeding of two new species of warblers in Florida. Fla. Nat. 35(4):134-135.

*Stevenson, H. M. 1976. Worm-eating Warbler, Pages 929-932 in Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.


Miles
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Kilometers
■ Breeding range
▨ Occurrence during migration and winter

Fig. VIII.D.150. WORM-EATING WARBLER (Helmitheros vermivorus)

Listed - Endangered

BACHMAN'S WARBLER Vermivora bachmanii (Audubon)

Order Passeriformes Family Parulidae

Distribution: Baynard (1942) lists Bachman's Warbler as a regular fall and spring migrant at Hillsborough River State Park in northeastern Hillsborough County. No other records exist for the study area, although numerous records exist for other parts of Florida, especially north Florida and the Keys (Howell 1932). However, these records all come from the 1880's and first decade of the 1900's. The bird has been sighted only once since then, in Calhoun County in 1951 (Sprunt 1954).

The breeding range of Bachman's Warbler was in the southeastern United States from Arkansas, Missouri and Kentucky through Alabama to South Carolina. It winters in the West Indies (Stevenson 1976). Dates of spring records in Florida range from late February to early April and fall records from July to early September.

Habitat: On the breeding grounds in South Carolina, Bachman's Warblers seem to prefer mature hardwood swamp forests with patches of thick undergrowth. Territories may extend to the forest edge and include other vegetative zones such as pine. Nests are placed within a few feet of the ground; males tend to spend much time in the upper story. They may colonize small patches of wet hardwood and cypress (Shuler 1977). Migrants in Florida have been reported from a variety of woodlands, usually in lowlands (Stevenson 1976).

Population Status: The Bachman's Warbler, if it survives at all, must exist in very low numbers. Reasons for its decline remain unknown.

Basis for Priority Status: The Bachman's Warbler is listed as Endangered by the U. S. Department of the Interior, Florida Game and Fresh Water Fish Commission and the Florida Committee on Rare and Endangered Plants and Animals.

Potential Impacts of Mining: Conceivably, elimination of lowland woodland habitats would further stress migrants of this nearly extinct bird.

Selected References:

*Baynard, O. E. 1942. The birds of Hillsborough River State Park. Fla. Park Serv. 18 pp.

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

*Shuler, J. 1977. Bachman's Warbler habitat. The Chat 41:19-23.

*Sprunt, A., Jr. 1954. Florida bird life. Coward-McCann, Inc., New York. 527 pp.

*Stevenson, H. M. 1976. Vertebrates of Florida, identification and distribution. Univ. Presses of Fla., Gainesville. 607 pp.

Listed - Blue List

YELLOW WARBLER Dendroica petechia (Linnaeus)

Order Passeriformes Family Parulidae

Distribution: Although the subspecies D. p. gundlachi is a resident breeder of the Florida Keys, elsewhere in the state the species is known only as a migrant during the periods April to May and July to October. Its breeding range extends from north central Alaska and northern Canada throughout most of the United States excluding most of Florida and the other Gulf coast states. It winters from southeastern Mexico to northern Brazil.

Habitat: This warbler exhibits a preference for swamp thickets and mixed hardwood swamps, but has also been noted in brushy pastures.

Population Status: The Yellow Warbler is an uncommon migrant in the seven-county area.

Basis for Priority Status: Although the most widely distributed and abundant member of the family Parulidae, the species is on the 1977 Blue List of the National Audubon Society because of concern for populations on the West Coast, prairie states, and southern Great Plains. The West Indian race, D. p. gundlachi, which was first found near Key West in 1941, is now a common resident of the outer Florida Keys and Florida Bay and ranges as far north as Miami (Robertson and Kushlan 1974). The possibility exists that this range expansion will continue and eventually reach the seven-county area.

Potential Impacts of Mining: Mining should have little effect on this and other uncommon migrant populations in the seven-county area, unless large-scale elimination of preferred habitats takes place. Destruction of mangrove habitats as a primary or secondary effect of mining would perhaps reduce the chances of future establishment of a breeding population of the West Indian race in the seven-county area.

Selected References:

Bent, A. C. 1953. Life histories of North American wood warblers. U. S. Nat. Mus. Bull. 203. 734 pp.

*Robertson, W. B., Jr., and J. A. Kushlan. 1974. The southern Florida avifauna, Pages 414-452 _in_ Gleason, P. J., ed., Environments of south Florida: present and past. Miami Geol. Soc. Memoir 2. 452 pp.

Sprunt, A., Jr. 1954. Florida bird life. Coward-McCann, Inc., New York. 527 pp.

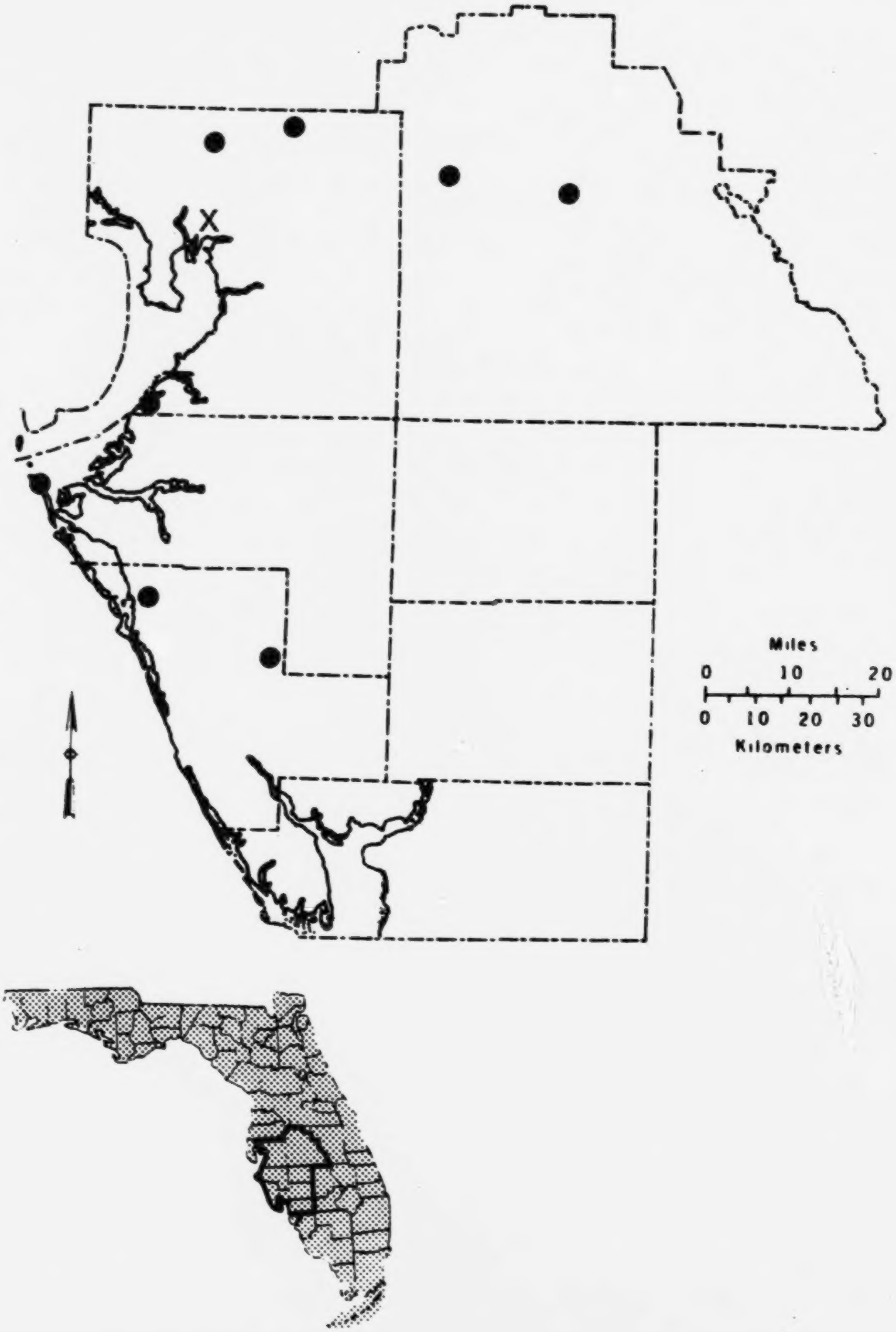
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Fig. VIII.D.151. YELLOW WARBLER (*Dendroica petechia*)

Listed - Endangered

KIRTLAND'S WARBLER *Dendroica kirtlandii* (Baird)

Order Passeriformes Family Parulidae

Distribution: Evidence for the occurrence of this species in the seven-county area is based on Baynard's (1942) listing of it as a very rare visitor in Hillsborough River State Park (Hillsborough County) and a recent, incredible sight record by K. C. Alvarez (pers. comm.) on 1 October 1976 from Oscar Scherer State Park (Sarasota County). The nearly extinct Kirtland's Warbler may occur yearly in Florida as a migrant. The species nests only in a few counties in Michigan and winters in the Bahama Islands (Mayfield 1960, Radabaugh 1974). En route the species is presumed, on some occasions at least, to occur in Florida.

Habitat: The breeding habitat of Kirtland's Warbler, which is in stands of young jack pines with fairly thick undergrowth, has been studied extensively (Mayfield 1960). Unfortunately little is known of its preferred habitat in winter, although Radabaugh (1974) describes it as similar in aspect to the breeding habitat. Stevenson (1976) suspects it occurs in a great variety of habitats during migration.

Population Status: Mayfield (1977) estimated the total population to be only 100 pairs in 1971, having declined 60 percent during the preceding decade, with Brown-headed Cowbird (*Molothrus ater*) brood parasitism suggested as a major factor causing the decline.

Basis for Priority Status: The nearly extinct Kirtland's Warbler is listed as Endangered by the U. S. Department of the Interior, Florida Game and Fresh Water Fish Commission, and the Florida Committee on Rare and Endangered Plants and Animals.

Potential Impacts of Mining: Because of the distribution, migratory path, habitat, and extreme rarity of the Kirtland's Warbler, it is unlikely mining will affect or has affected its status.

Selected References:

*Baynard, O. E. 1942. The birds of Hillsborough River State Park. Fla. Park Serv. 18 pp.

*Mayfield, H. 1960. The Kirtland's Warbler. Cranbrook Inst. Sci., Bloomfield Hills, Michigan. 242 pp.

*Mayfield, H. 1977. Brown-headed Cowbird: agent of extermination? Am. Birds 32(2):107-113.

*Radabaugh, B. E. 1974. Kirtland's Warbler and its Bahama wintering grounds. Wilson Bull. 86:374-383.

*Stevenson, H. M. 1976. Kirtland's Warbler, Pages 705-708 in Inventory of rare and endangered biota of Florida (Interim mircofiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

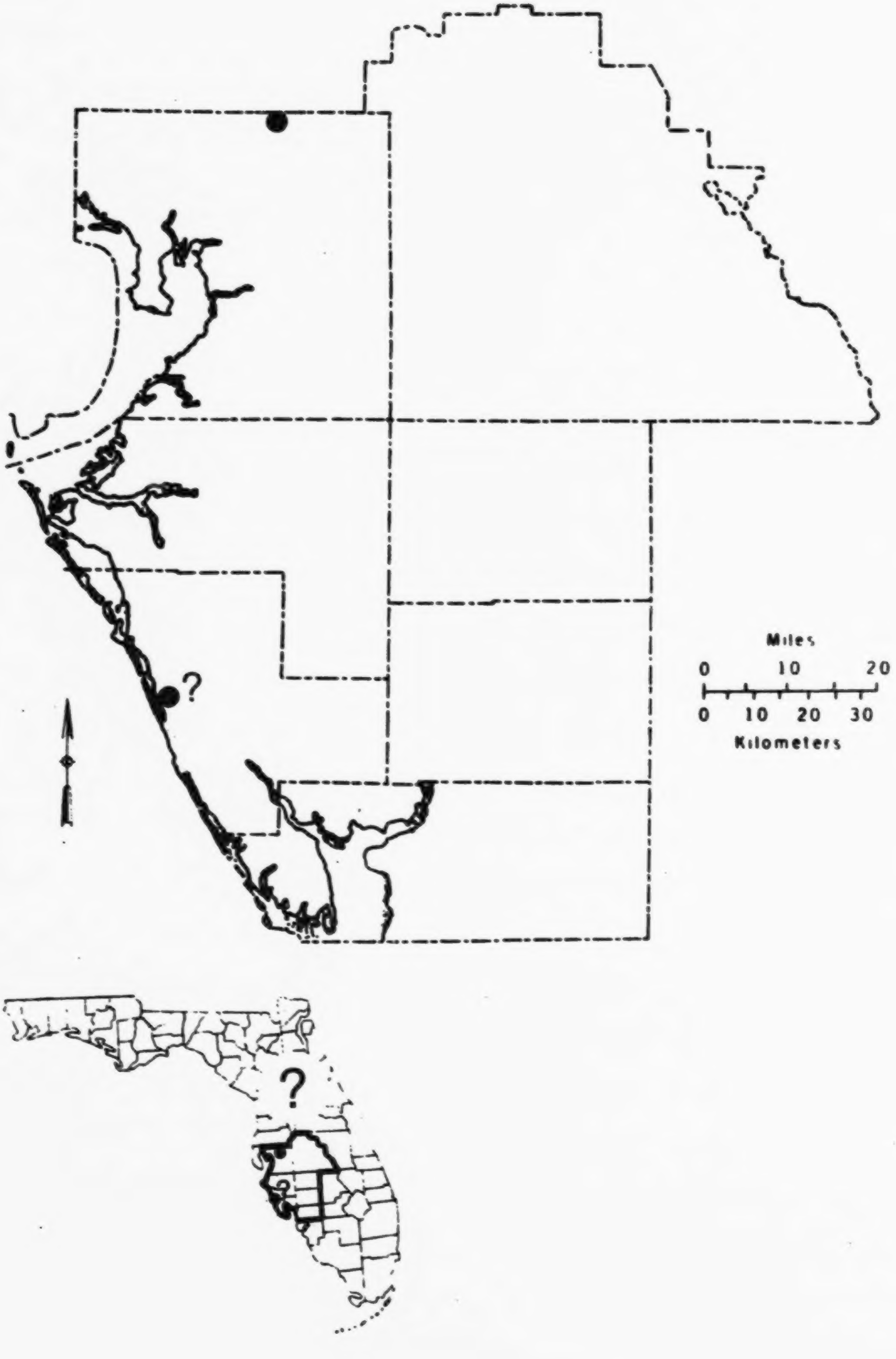
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Fig. VIII.D.152. KIRTLAND'S WARBLER (Dendroica kirtlandii)

Listed - Species of Special Concern

FLORIDA PRAIRIE WARBLER

Dendroica discolor paludicola Howell

Order Passeriformes

Family Parulidae

Distribution: The Florida Prairie Warbler has been recorded from all coastal counties (Charlotte, Hillsborough, Manatee, Sarasota) of the seven-county area. It breeds in the Florida Keys and northward along the Gulf coast to Levy County and along the Atlantic coast to Volusia County. The northern race, *D. d. discolor*, breeds in northern Florida, from Leon County westward. No substantiated records of Prairie Warblers summering or breeding in the interior of the peninsula exist (Stevenson 1976). Although the species also winters from central Florida southward to the West Indies, further study is required to determine which subspecies is involved. The species occurs statewide in migration, from mid-March to mid-May, and mid-July to early November.

Habitat: The Florida Prairie Warbler is found predominantly in mangrove thickets along the coast, and on nearby islands. In contrast, the northern race inhabits brushland, overgrown pastures, and old fields in the interior of the peninsula.

Population Status: The Florida race of the Prairie Warbler is locally common (*i.e.*, in mangrove habitat). The species is common in migration but uncommon through the winter. Tampa bird counts reflect these differences in summer and winter densities with 3.4 birds seen per 10 party hours (mean = 22) in summer and 0.7 birds per 10 party hours (mean = 10) in winter (Table VIII.D.11). As there is no migration at the times of these censuses it is probable that the numbers reflect true summer and winter populations. Robertson (1955) estimated breeding density on a scrubby mangrove island in Florida Bay, Monroe County, to be 9 pairs per 40 hectares.

Basis for Priority Status: The Florida Prairie Warbler is listed as a Species of Special Concern by the Florida Committee on Rare and Endangered Plants and Animals because of its dependence on mangroves. Development in coastal areas has resulted in large scale destruction of mangroves and subsequent elimination of the few species of land birds which breed exclusively in mangroves, including the Mangrove Cuckoo, Black-whiskered Vireo, and Cuban Yellow Warbler, as well as the Florida Prairie Warbler. The Prairie Warbler is also of biological interest because of the disjunct endemic subspecies in Florida, and the exact seasonal distributions of these races need further investigation. The Florida race, though originally derived from the continent, more recently has colonized southern Florida from the West Indies, and like all other West Indian land birds known to breed in Florida, with the exception of the Zenaida Dove, appears to be extending its range northward (Robertson and Kushlan 1974).

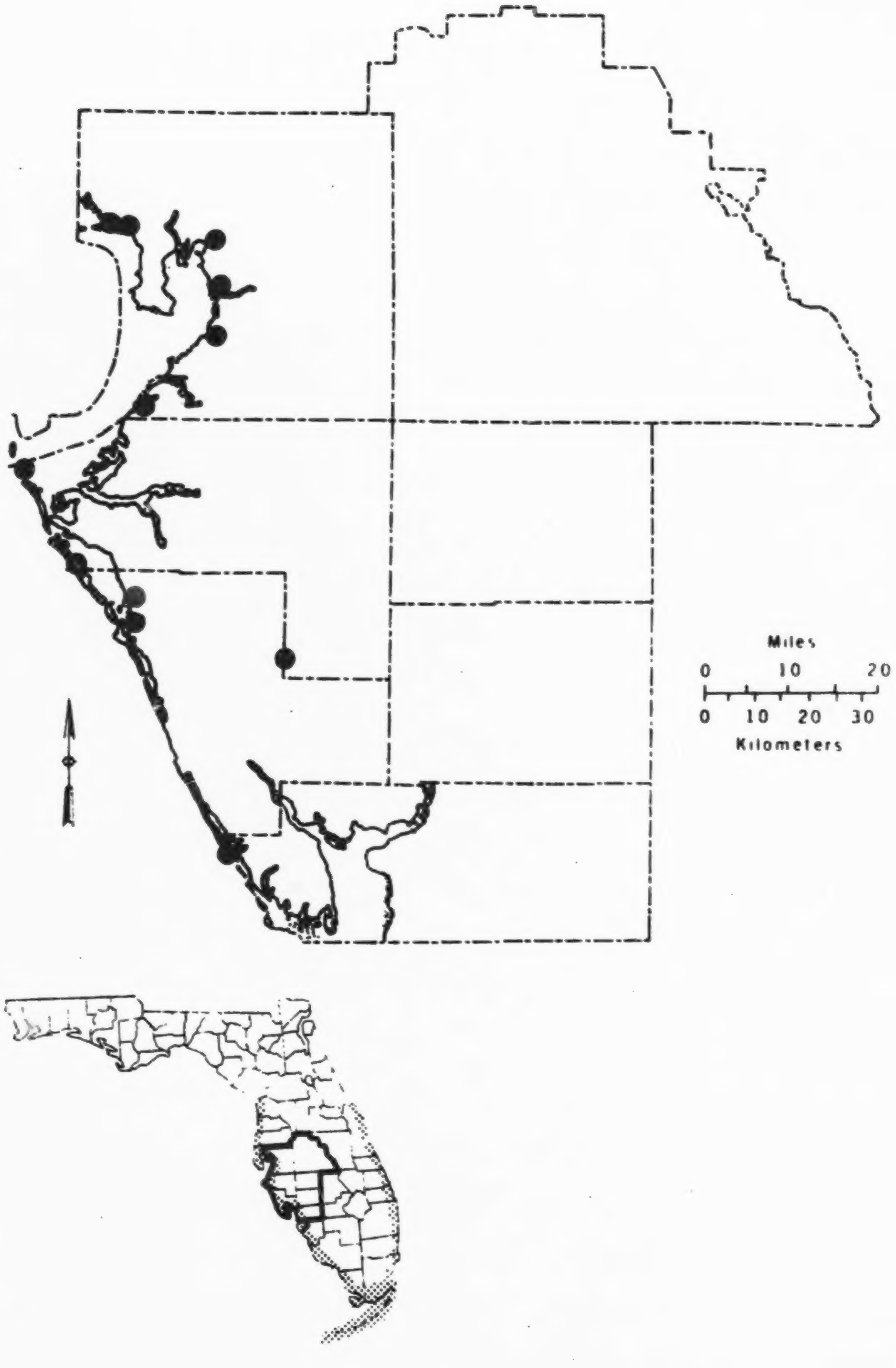
Potential Impacts of Mining: The mangroves in Florida already are a threatened habitat, and their degradation or destruction, whether related indirectly to the mining industry or to other developmental disturbance, undoubtedly will eliminate the avian breeding populations dependent on this habitat.

Selected References:

*Robertson, W. B. 1955. An analysis of the breeding-bird populations of tropical Florida in relation to the vegetation. Ph.D. Thesis. Univ. of Ill., Urbana.

*Robertson, W. B., Jr., and J. A. Kushlan. 1974. The southern Florida avifauna, Pages 414-452 in Gleason, P. J., ed., Environments of south Florida: present and past. Miami Geol. Soc. Memoir 2. 452 pp.

*Stevenson, H. M. 1976. Florida Prairie Warbler, Pages 933-936 in Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.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Kilometers

Fig. VIII.D.153. FLORIDA PRAIRIE WARBLER (Dendroica discolor paludicola)

Listed - Rare

LOUISIANA WATERTHRUSH | *Seiurus motacilla* (Vieillot)

Order Passeriformes | Family Parulidae

Distribution: Records of the Louisiana Waterthrush exist from all counties in the study area except DeSoto and Hardee. Breeding records exist from northwestern Florida, and it is a rare winter resident in southern Florida. It mainly occurs in the state as a migrant, chiefly from late February to early May and early July to early October. The breeding range extends from Minnesota south to northeastern Texas and throughout most of the eastern United States, excluding the extreme northeast and Gulf coast and the coastal portions of Georgia and the Carolinas.

Habitat: This species lives along streams in woodlands and in swamps, and has been recorded in similar wet woodlands in the seven-county area, such as along the lake shore and river's edge in Myakka River State Park (K. C. Alvarez pers. comm.) and in the Green Swamp (Edscorn 1976).

Population Status: According to Stevenson (1976) the Florida population is at least stable and probably increasing.

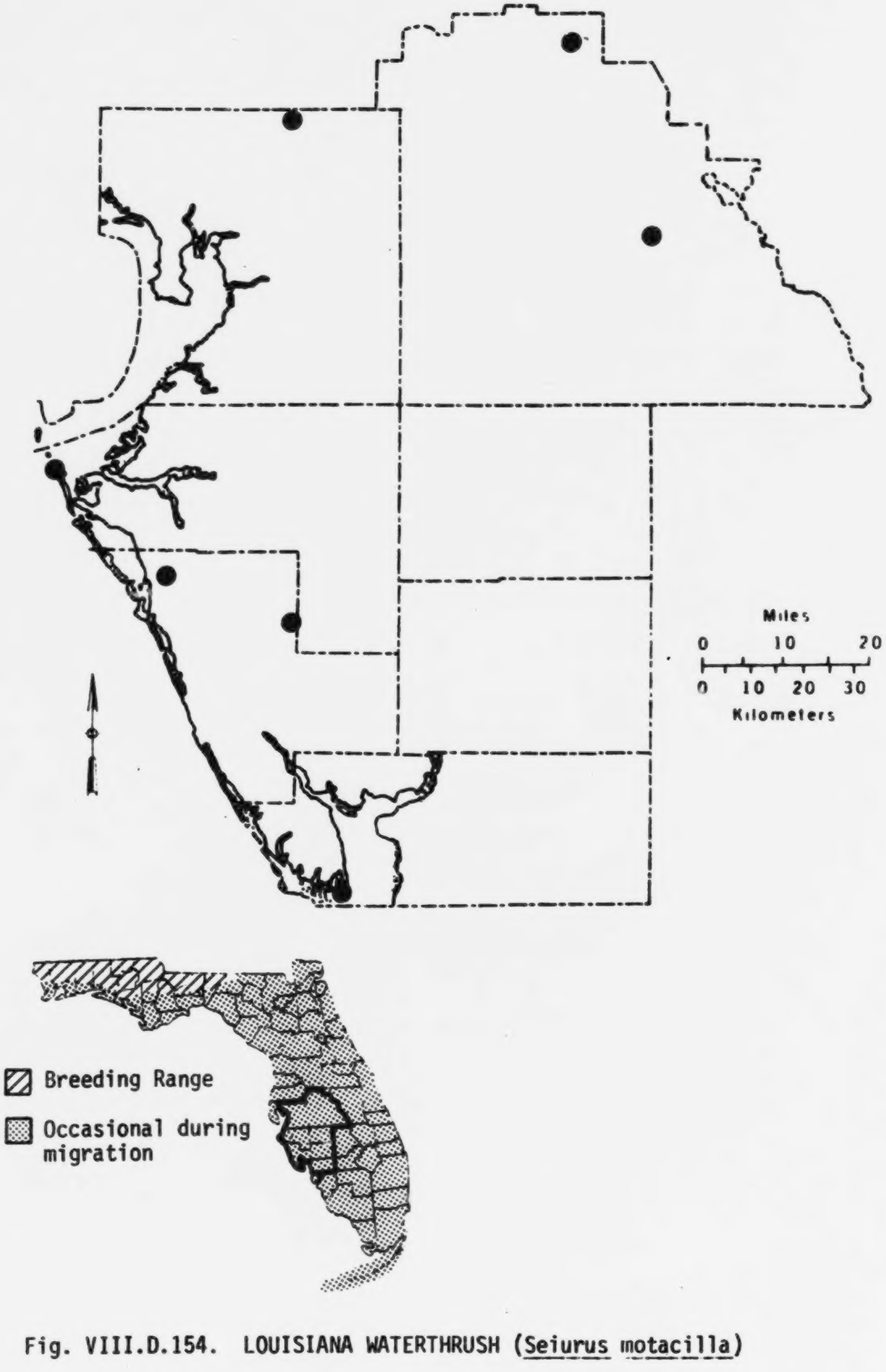
Basis for Priority Status: The scarcity of this species in Florida and the fact that Florida is at the southern edge of its breeding range are the bases for its listing as Rare by the Florida Committee on Rare and Endangered Plants and Animals.

Potential Impacts of Mining: Elimination of mixed hardwood and cypress swamps and other forested wetland habitat is likely to decrease the population of migrants of this species in the seven-county area.

Selected References:

*Edscorn, J. B. 1976. Avian highlights of the year. Lake Region Nat. Fall-Winter 1976-77. pp. 17-19.

*Stevenson, H. M. 1976. Louisiana Waterthrush, Pages 843-846 *in* Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.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Kilometers
Breeding Range
Occasional during migration

Fig. VIII.D.154. LOUISIANA WATERTHRUSH (Seiurus motacilla)

Listed - Blue List

YELLOW-BREASTED CHAT | *Icteria virens* (Linnaeus)

Order Passeriformes | Family Parulidae

Distribution: The Yellow-breasted Chat is a transient in the seven-county area, records existing from Hillsborough, Manatee, Polk, and Sarasota counties. It appears as a migrant throughout Florida from April to May and August to October. The species breeds in northern Florida and throughout most of the conterminous United States. It winters south to Panama, rarely in Florida.

Habitat: This bird occupies second-growth habitats such as dense thickets and bramble patches on low, wet ground near streams or at the edges of ponds or swamps. It also is found in patches of thick shrubbery in upland pastures and woodland edges.

Population Status: The Yellow-breasted Chat is a rare migrant in the seven-county area. One record of a wintering bird exists from Lakeland, Polk County (Edscorn 1975).

Basis for Priority Status: This is a Blue List species which should be "critically monitored" (Arbib 1977) and evidence of it extending its breeding range southward in Florida should be sought.

Potential Impacts of Mining: The rarity of this transient in the seven-county area does not warrant impact assessment.

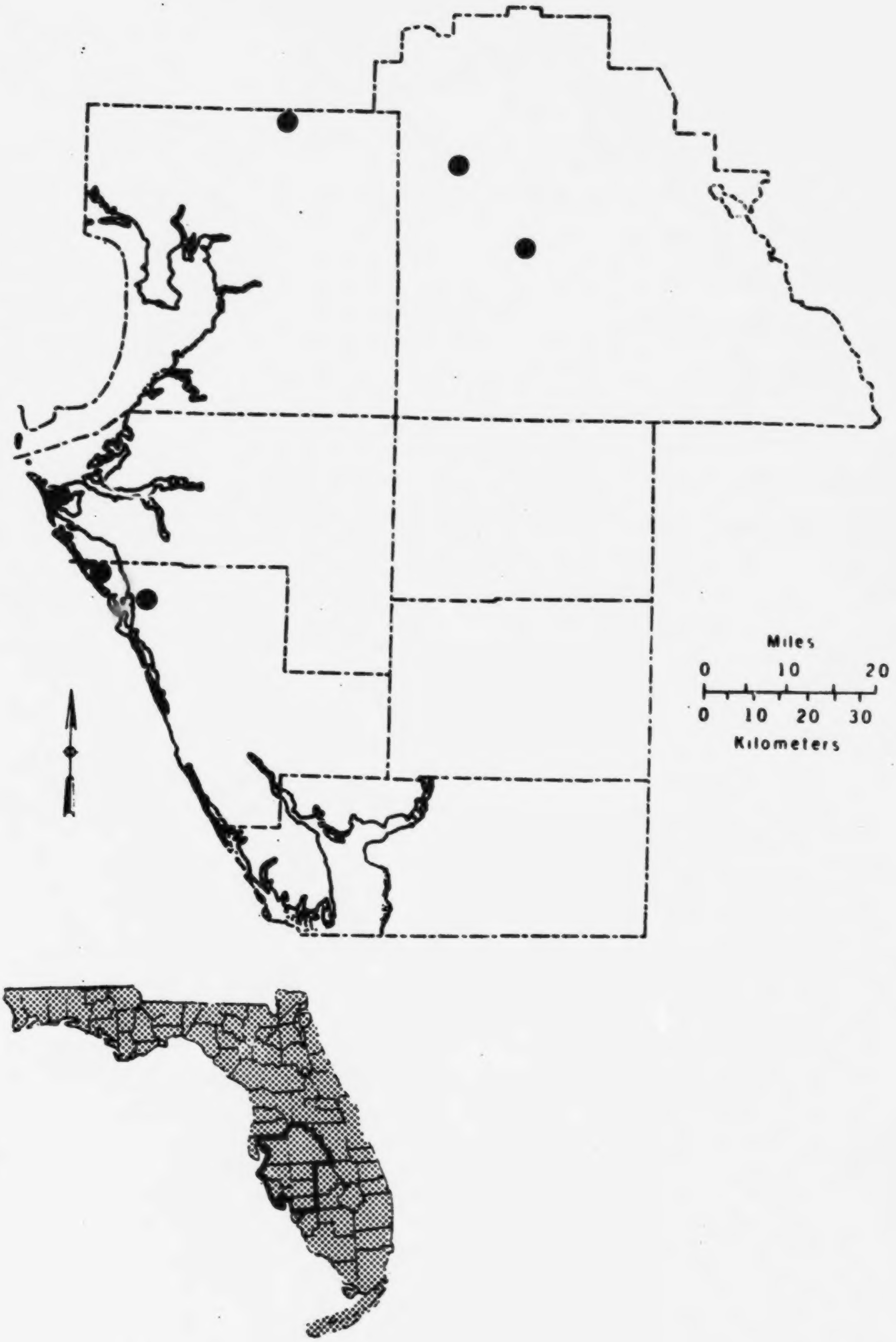
Selected References:

*Arbib, R. 1977. The Blue List for 1977. Am. Birds 30(6):1031-1039.

Bent, A. C. 1953. Life histories of North American wood warblers. U. S. Nat. Mus. Bull. 203. 734 pp.

*Edscorn, J. B. 1975. Avian highlights of the year. Lake Region Nat., Fall-Winter 1975-1976. pp. 17-21.

Sprunt, A., Jr. 1954. Florida bird life. Coward-McCann, Inc., New York. 527 pp.


Miles
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Kilometers

Fig. VIII.D.155. YELLOW-BREASTED CHAT (Icteria virens)

Listed - Rare

AMERICAN REDSTART

Setophaga ruticilla ruticilla
(Linnaeus)

Order Passeriformes

Family Parulidae

Distribution: The American Redstart has been recorded throughout Florida in migration, chiefly from late March to late May and mid-July to early November. Records from the seven-county area include Hillsborough, Manatee, Polk, and Sarasota counties. The subspecies Setophaga r. ruticilla breeds in northwestern Florida and winters from southern Florida and southern California south to northern Brazil, including the West Indies. The species' large breeding range extends from southeastern Alaska and southern Canada throughout most of the north central and eastern United States, excluding the Gulf coast and southern Atlantic coast.

Habitat: The American Redstart prefers second-growth deciduous woodlands for breeding, usually with a canopy of mature trees (Stevenson 1976). In the seven-county area, migrants have been recorded from mixed hardwood swamps as well as live oak and cabbage palm hammocks.

Population Status: Though a common and regular migrant in the seven-county area, this warbler is a rare breeder in Florida.

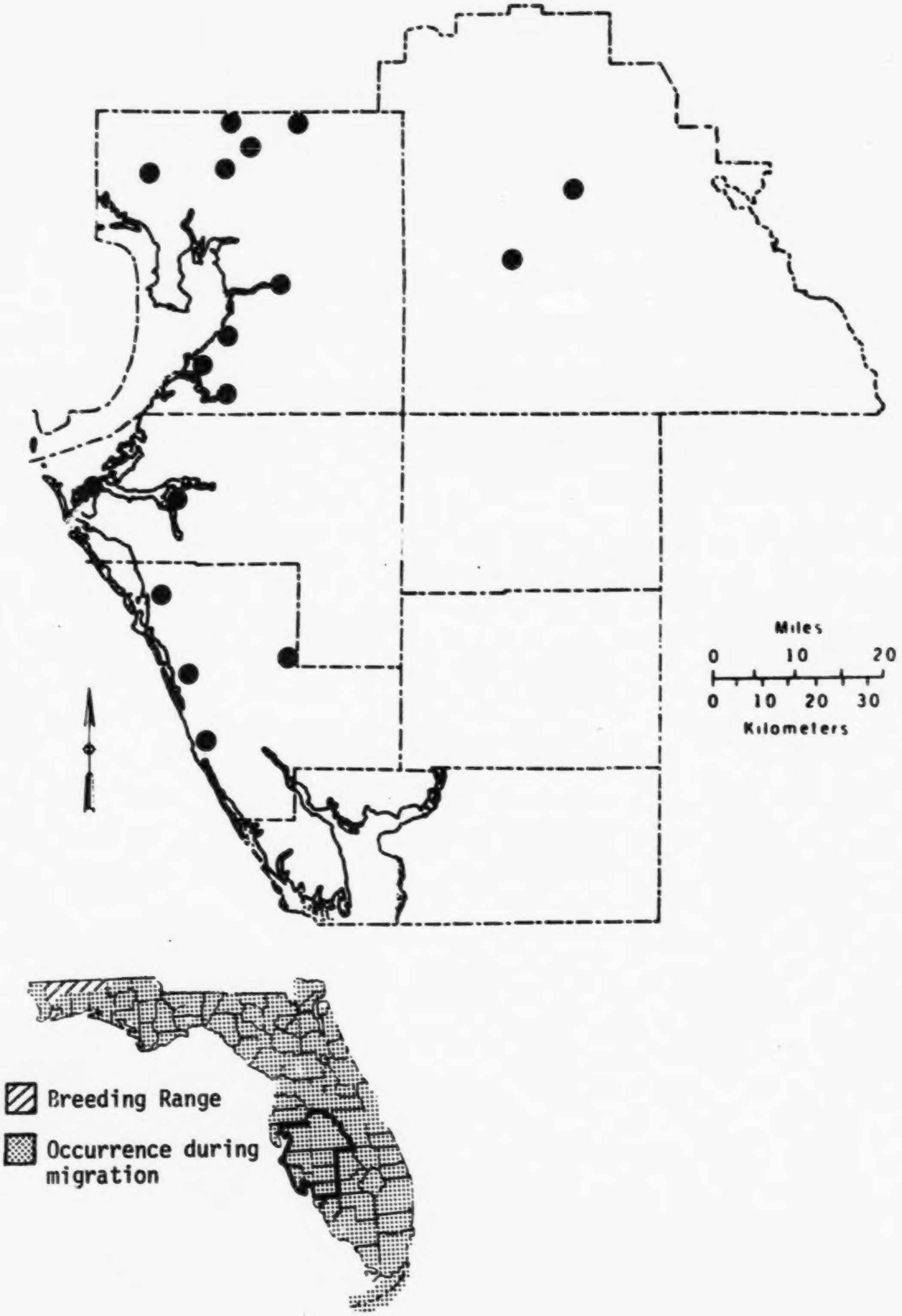
Basis for Priority Status: Though it occupies a wide range in the United States, this warbler is listed as Rare by the Florida Committee on Rare and Endangered Plants and Animals because of its extremely limited breeding range in Florida.

Potential Impacts of Mining: Elimination of wet woodlands in mining may decrease the abundance of these migrants in the seven-county area.

Selected References:

Sprunt, A., Jr. 1954. Florida bird life. Coward-McCann, Inc., New York. 527 pp.

*Stevenson, H. M. 1976. American Redstart, Pages 847-850 in Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.


Miles
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Kilometers
▨ Breeding Range
▦ Occurrence during migration

Fig. VIII.D.156. AMERICAN REDSTART (Setophaga ruticilla ruticilla)

Biologically Significant

HOUSE SPARROW | *Passer domesticus* (Linnaeus)

Order Passeriformes | Family Ploceidae

Other Names: English Sparrow

Distribution: The exotic House Sparrow, which was introduced into the eastern United States in the middle 1800's, now occurs throughout the study area, the remainder of Florida, and also throughout the conterminous United States and southern Canada.

Habitat: The House Sparrow is closely associated with man and his structures. It is abundant in suburbs, urban areas with some vegetation, and rural areas. House Sparrows often attain huge numbers in cattle feed yards. The species is rare in natural habitats.

Population Status: Using a strip-census technique, Woolfenden and Rohwer (1969a) counted birds in 1963 in suburban habitats in Bradenton (Manatee County) and Tampa (Hillsborough County). The House Sparrow accounted for from 24 to 31 percent of all birds seen per mile of census. A comparison of the strip-census technique with intensive plot studies suggested that only about 30 percent of all House Sparrows present were being counted. In Pinellas County, adjacent to the seven-county area, plot censuses of House Sparrows in the major suburban habitats of St. Petersburg revealed a density of 225 breeding pairs per 100 acres (Woolfenden and Rohwer 1969b). Similar high densities are to be expected in suburban environs within the study area. The House Sparrow is primarily a permanent resident, therefore populations would be expected to fluctuate annually only as related to reproduction. However, some seasonal shifts in populations may occur.

Breeding is in spring; total populations of flying birds would be highest in summer and fall. The number of House Sparrows seen per 10 party hours on the Tampa counts, summer and winter, suggests this relationship (Table VIII.D.11).

Basis for Priority Status: The House Sparrow has been associated with humans at least throughout recent historical times (Summers-Smith 1963). In North America the species has shown no tendency to desert man-made habitats for purely natural ones. Therefore the House Sparrow is a good biological indicator of man-modified ecosystems.

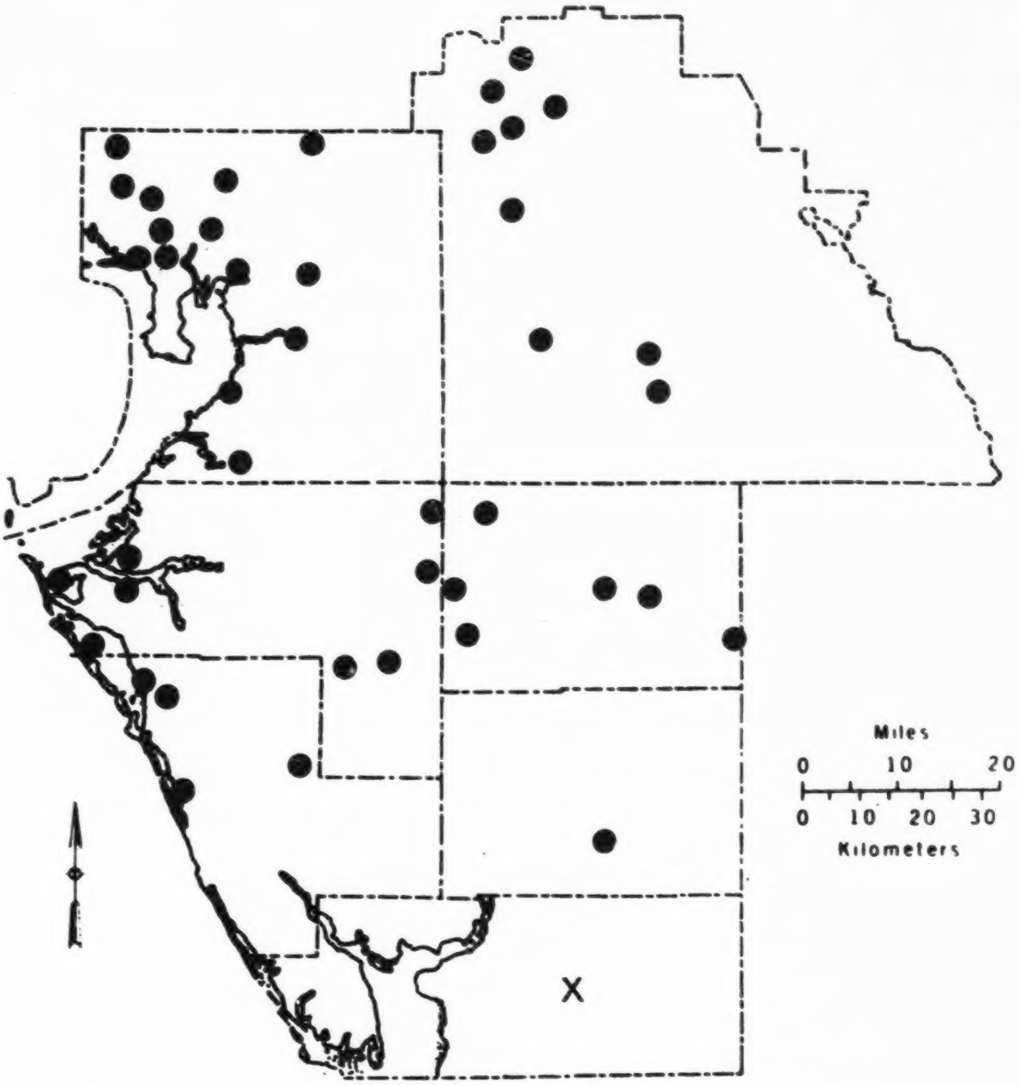
Potential Impacts of Mining: The direct and immediate results of mining should have little effect on House Sparrows. The spread of man-made structures will increase the habitat available for the species.

Selected References:

*Summers-Smith, J. D. 1963. The House Sparrow. Collins, London. 269 pp.

*Woolfenden, G. E., and S. A. Rohwer. 1969a. Breeding birds in a Florida suburb. Bull. Fla. State Mus. 13(1):1-83.

*Woolfenden, G. E., and S. A. Rohwer. 1969b. Relative abundance of bird populations in residential districts of the Tampa Bay area. Fla. St. Brd. of Health Monogr. No. 12:110-117.



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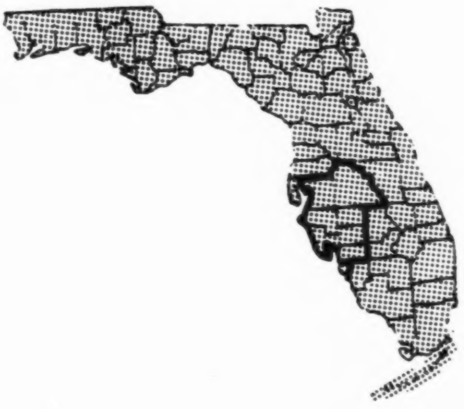


Fig. VIII.D.157. HOUSE SPARROW (Passer domesticus)

Listed - Blue List

GRASSHOPPER SPARROW *Ammodramus savannarum* (Gmelin)

Order Passeriformes Family Fringillidae

Distribution: Records of Grasshopper Sparrows exist for six of the seven counties, the poorly studied Hardee County being the exception. Widespread in winter in Florida, the Grasshopper Sparrow breeds throughout most of the United States and southern Canada. The winter range extends from the southern United States southward into Mexico.

Four races of the Grasshopper Sparrow are described, including *A. s. floridanus* which is restricted to a small portion of south central peninsular Florida (Stevenson 1976). Though no specific locality is cited, Stevenson's map shows southeastern Polk County to be included in the range of this rare bird. Although Van Duyn (1941) listed the Grasshopper Sparrow as resident at Myakka River State Park, Baynard (1942) found none, and no recent records exist (Fla. Dept. Nat. Res. 1976). Records of Evans (1923) cannot be assigned to a county, and the breeding records assigned to the Florida race by Howell (1932)may be of the race widespread in the southeastern United States (Stevenson 1976). Thus it is concluded that no valid record of *A. s. floridanus* exists for the study area.

Habitat: All races of the Grasshopper Sparrow are found only in hayfields and weedy fallow fields. They avoid wet meadows and open, short-grass fields, preferring the dry, tall grass habitats.

The Florida race is described as inhabiting regions of saw palmetto and dwarf oaks (Howell 1932), but the few later records (1940's, 1970's) are from cattle pastures (Stevenson 1976).

Population Status: The Grasshopper Sparrow probably is best considered an uncommon winter resident. For the Lakeland region Edscorn (unpubl. MS) lists it as rare and local. The species is secretive, solitary, and non-vocal on the wintering grounds. Usually an observer must come within a few feet of the bird before it flushes. Thus it is difficult to census. The Breeding Bird Survey shows a highly significant continent-wide decline, and the peninsular Florida population seems to be nearing extinction (Arbib 1977).

Basis for Priority Status: The Grasshopper Sparrow is on the 1977 Blue List of the National Audubon Society, and the endemic peninsular Florida race is listed as Endangered by the Florida Game and Fresh Water Fish Commission and the Florida Committee on Rare and Endangered Plants and Animals.

Potential Impacts of Mining: Grassland habitat acceptable to the Grasshopper Sparrow is scarce and decreasing. Activities that would eliminate native grasslands would decrease habitat suitable for the Grasshopper Sparrow. The importance of pastureland to this species needs study. Grasslands created on reclaimed mined lands would probably provide suitable habitats for Grasshopper Sparrows with proper management.

Selected References:

*Arbib, R. 1977. The Blue List for 1977. Am. Birds 30(6):1031-1039.

*Baynard, O. E. 1942. A check-list of birds Myakka River State Park. Fla. Forest and Park Serv., Sarasota, Florida. 15 pp.

*Edscorn, J. B. Birds of the Lake Region. Unpubl. MS.

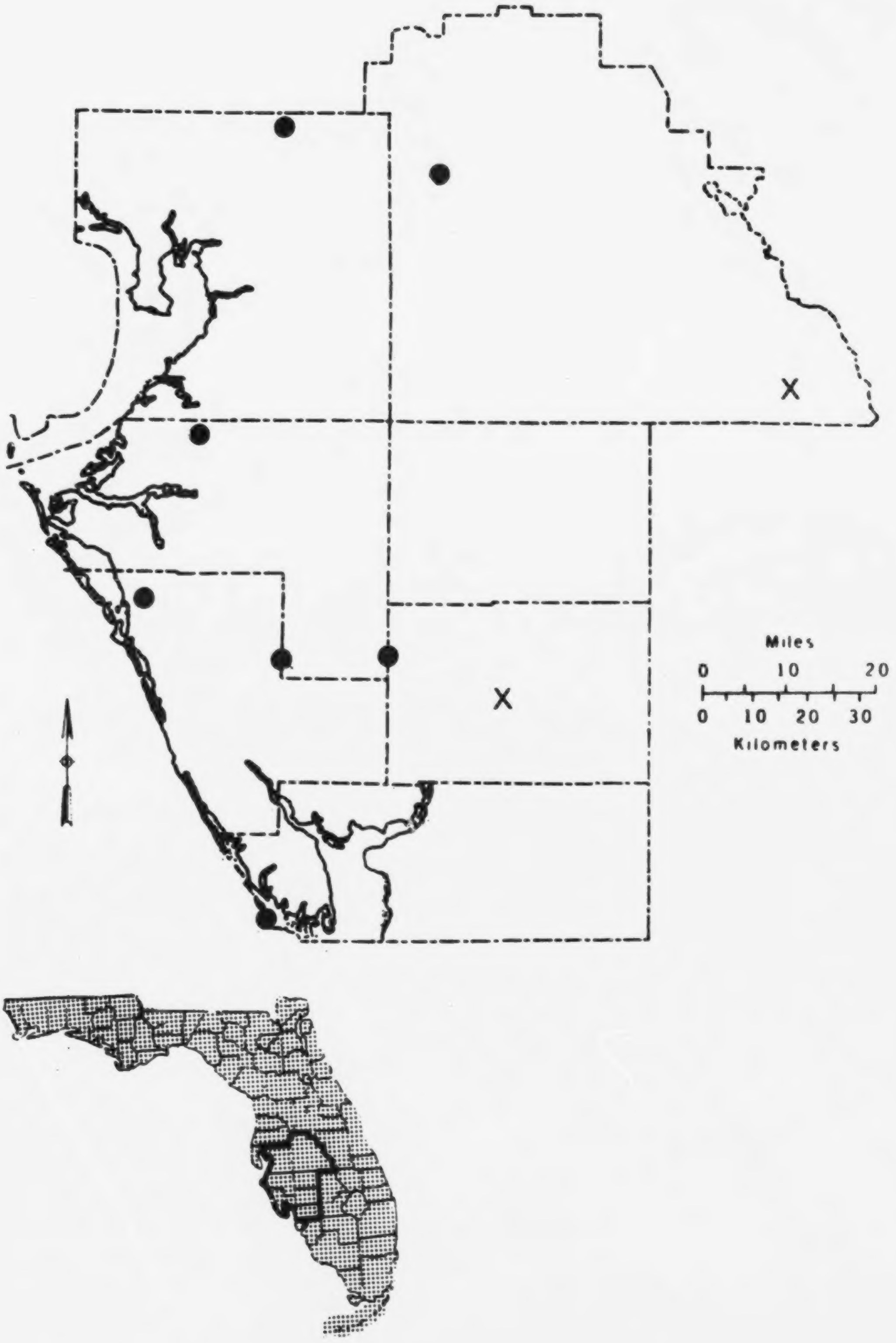
*Evans, L. I. 1923. An annotated list of birds observed in south Florida. Oologist 40:2-8.

*Florida Department of Natural Resources. 1976. Vertebrates of Myakka River State Park. 26 pp.

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.

*Stevenson, H. M. 1976. Vertebrates of Florida, identification and distribution. Univ. Presses of Fla., Gainesville. 607 pp.

*Van Duyn, G. 1941. Progress report of biological reconnaissance Myakka River State Park, Florida (FLA SP-4) with preliminary checklists of vertebrate fauna. 25 pp.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Kilometers

Fig. VIII.D.158. GRASSHOPPER SPARROW (*Ammodramus savannarum*)

Listed - Blue List

HENSLOW'S SPARROW *Ammodramus henslowii* (Audubon)

Order Passeriformes Family Fringillidae

Distribution: Henslow's Sparrows are recorded from two counties, Hillsborough and Polk, in the seven-county area. Baynard (1942) listed the species as "a rare but fairly regular park migrant in winter" in Hillsborough River State Park, Hillsborough County, although Stevenson (1967) failed to find the species in the park in the 1960's. The species is listed for the Lakeland Christmas Bird Counts in 1967 and 1970 and for the Lake Wales Christmas Bird Counts in 1970, 1974, and 1975. However, Edscorn (unpubl. MS) considers these observations questionable.

The Henslow's Sparrow probably occurs annually in the study area, as a winter resident and transient, but its overall rarity and secretiveness have resulted in few convincing records.

The species breeds in the northeastern United States and winters in the southern part of the Atlantic coastal plain.

Habitat: Henslow's Sparrows typically live in broomsedge fields and wet meadows. They are difficult to flush, solitary, and non-vocal in their winter range, which results in little information being available on their habitat preferences.

Population Status: Based on the few records available, the Henslow's Sparrow must be considered as very rare in the study area. However, because of its inconspicuousness, it may actually be more common than present data suggest.

Basis for Priority Status: The Henslow's Sparrow is on the 1977 Blue List of the National Audubon Society because of widespread indication of declining populations in its breeding range.

Potential Impacts of Mining: So little is known of the distribution and habitat preferences of this species in the seven-county area that it is impossible to assess the impact of mining on it with any degree of confidence. If it is as rare as present records suggest, mining would probably have no significant impact on its status. Grasslands resulting from reclamation would possibly compensate for suitable habitats lost through mining, with no net, long-term change in amount of available habitat for the species.

Selected References:

Agey, N. 1967. Lakeland, Fla. (Christmas Bird Count). Aud. Field Notes 21(2):200-201.

*Baynard, O. E. 1942. A check-list of birds Myakka River State Park. Fla. Forest and Park Serv., Sarasota, Florida. 15 pp.

*Edscorn, J. B. Birds of the Lake Region. Unpubl. MS.

*Stevenson, J. A. 1967. A list of the vertebrates identified in Hillsborough River State Park. Fla. Brd. of Parks. 16 pp.

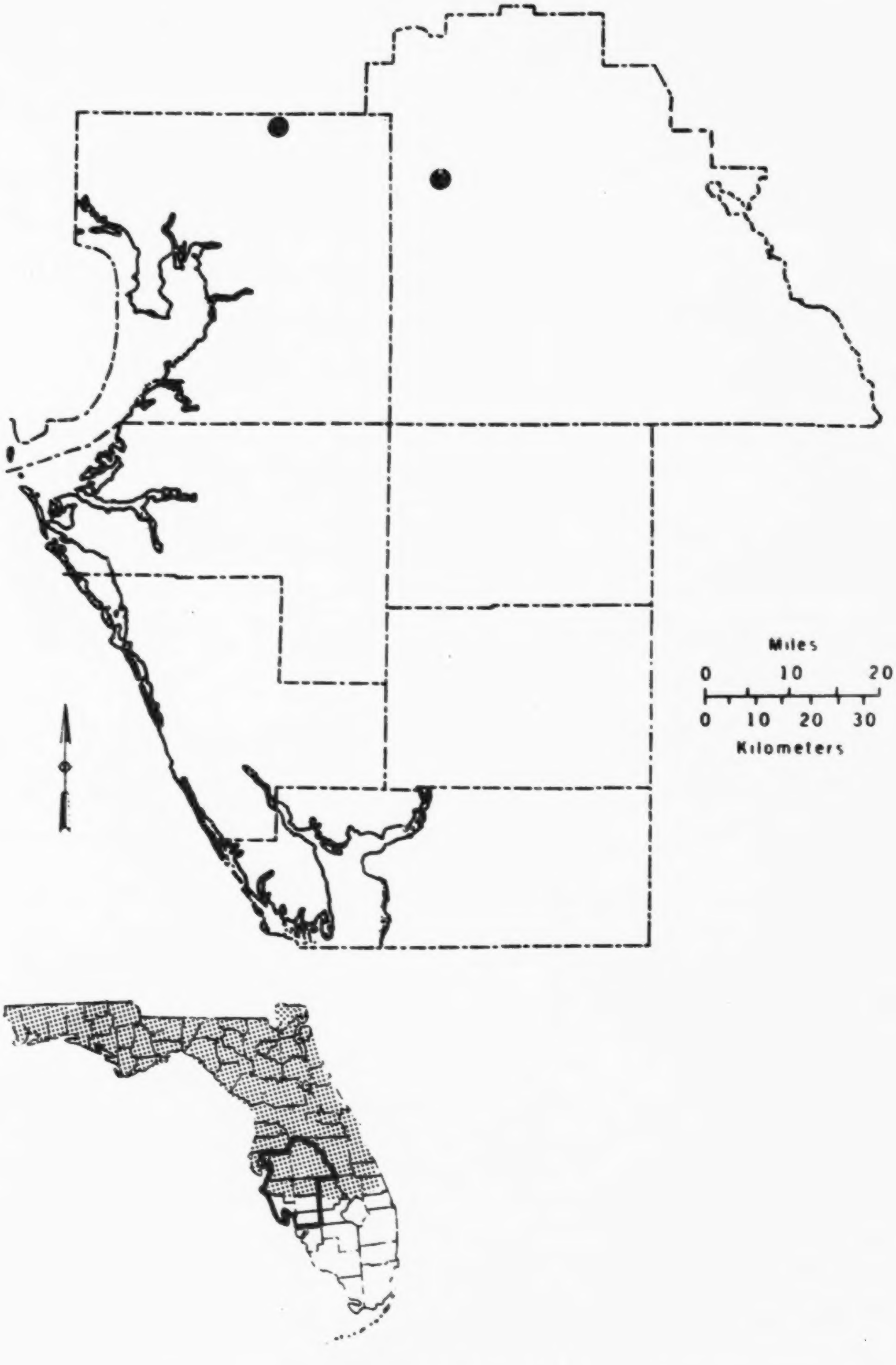
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Fig. VIII.D.159. HENSLOW'S SPARROW (Ammodramus henslowii)

Listed - Blue List

VESPER SPARROW   *Pooecetes gramineus* (Gmelin)

Order Passeriformes   Family Fringillidae

Distribution: Records of the Vesper Sparrow exist for five of the seven counties: Charlotte, Hillsborough, Manatee, Polk, and Sarasota. The species occurs throughout Florida and most of the southern United States in winter; it breeds in the northern United States and much of Canada.

Habitat: Vesper Sparrows live in a variety of open, drier, grassland habitats. Unimproved pastures, old fields, abandoned citrus groves, and roadside grasslands seem to be preferred.

Population Status: The Vesper Sparrow is a generally distributed, uncommon, winter resident in the seven-county area. It is present from October to April. As is true for several species of sparrows that winter in Florida, the Vesper Sparrow is more common in northern Florida and becomes scarcer southward in the peninsula. The northern portions of Hillsborough and Polk counties probably harbor the largest populations (Stevenson 1967).

Basis for Priority Status: The Vesper Sparrow is on the 1977 Blue List of the National Audubon Society.

Potential Impacts of Mining: Mining seems likely to have little effect on Vesper Sparrow populations in the seven-county area. Mined areas reclaimed to well-drained grasslands would probably provide favorable habitats for this species.

Selected References:

*Stevenson, J. A. 1967. A list of the vertebrates identified in Hillsborough River State Park. Fla. Brd. of Parks. 16 pp.

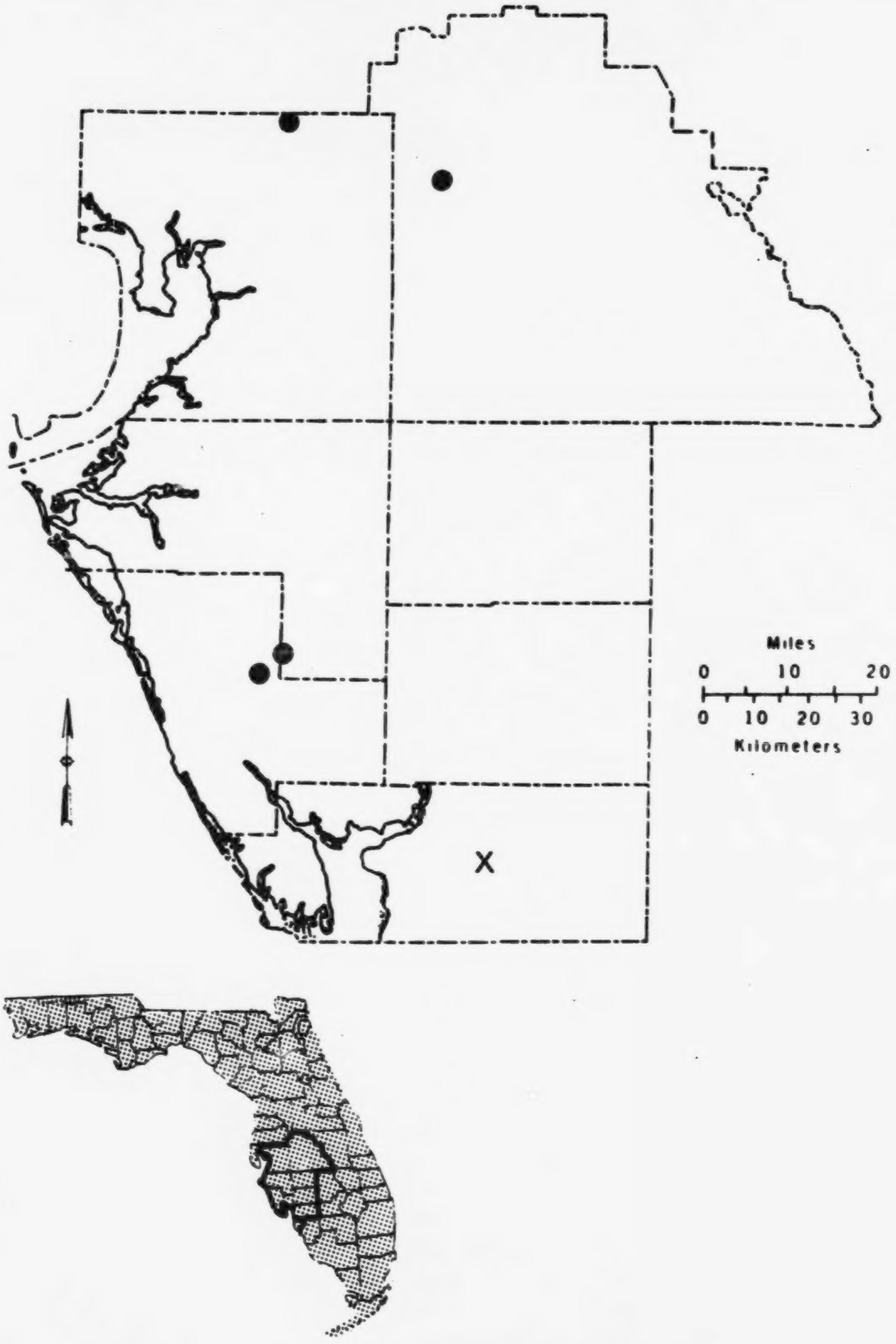
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Fig. VIII.D.160. VESPER SPARROW (Pooecetes gramineus)

Listed - Blue List

BACHMAN'S SPARROW   Aimophila aestivalis (Lichtenstein)

Order Passeriformes   Family Fringillidae

Other Names: Pine-woods Sparrow

Distribution: The Bachman's Sparrow is recorded from six of the seven counties in the study area, the exception being Charlotte County. The species ranges from near Lake Okeechobee in Florida north to Maryland and Illinois and west to Oklahoma and central Texas. The nominate race, A. a. aestivalis, is restricted to the southeast, from South Carolina and Georgia south into Florida. Individuals of the one other race, A. a. bachmani, that breed in the northwestern portion of the species' range migrate south for the winter. Howell (1932) records members of this race wintering as far south as Tampa Bay.

Habitat: The Bachman's Sparrow has narrow habitat tolerances. It is confined to open pine flatwoods with an understory of saw palmetto and grasses, especially wire grass (Aristida). Reduction or elimination of trees and palmetto and increased density of the grasses, which occurs when flatwoods are altered for pasturing cattle, eliminates Bachman's Sparrows. More than half of 22 habitat records from the seven-county area are from open pine habitats. Old fields and dry prairies are also represented. Priority avian species associated with Bachman's Sparrows in the dry, open pine flatwoods are the Red-cockaded Woodpecker (Picoides borealis), Brown-headed Nuthatch (Sitta pusilla), and the Eastern Bluebird (Sialia sialis).

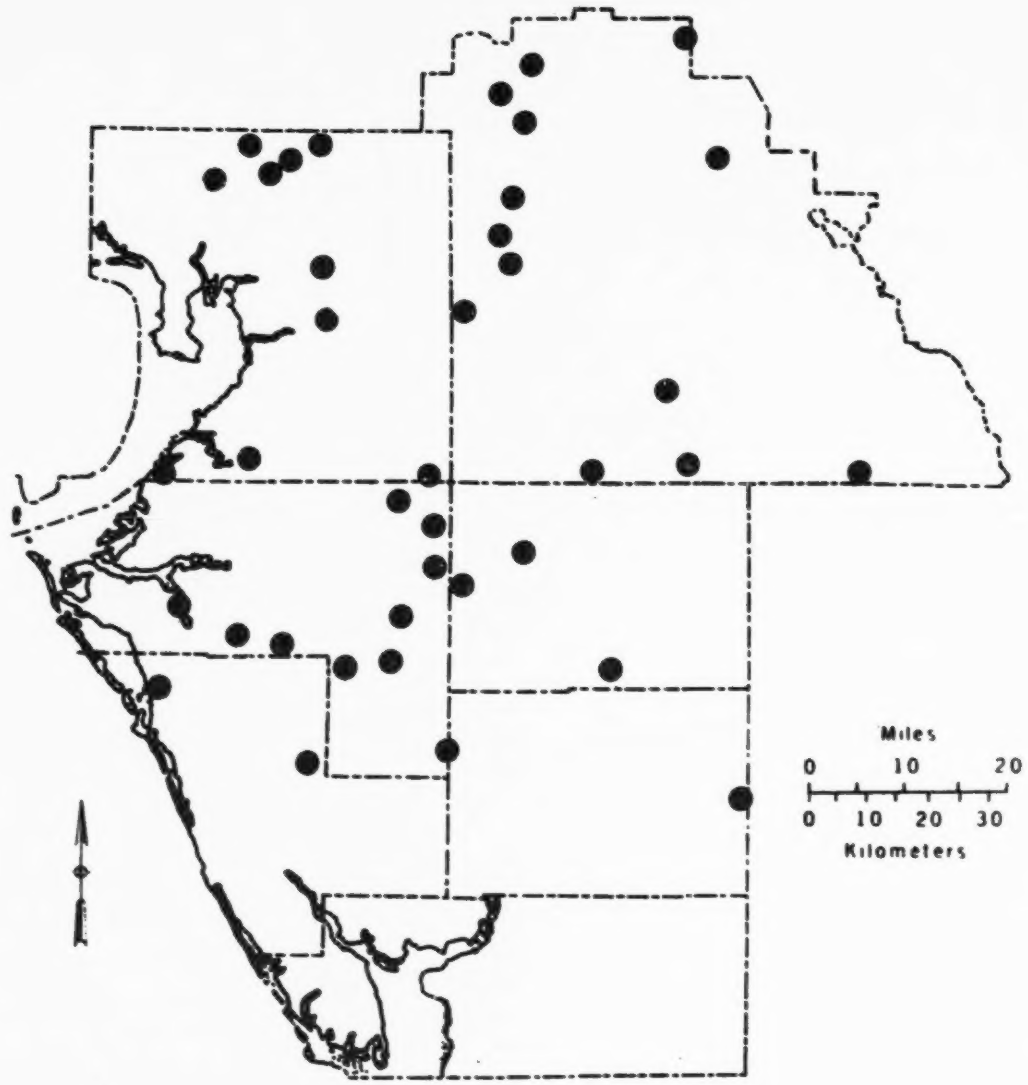
Population Status: The Bachman's Sparrow is uncommon throughout the seven-county area. In optimum habitat, which is scarce in the study area, the species may be common. In Highlands County, which is adjacent to the seven-county area, the breeding population in suboptimum open scrubby flatwoods habitat was estimated at about 3 pairs in 1 square mile on the basis of singing males (G. E. Woolfenden pers. comm.). The Bachman's Sparrow is very secretive; therefore, winter records when the species is silent are not reliable sources for population estimates.

Basis for Priority Status: The Bachman's Sparrow is on the 1977 Blue List of the National Audubon Society and is considered biologically significant because of its narrow habitat tolerance.

Potential Impacts of Mining: Extensive elimination of inland pine flatwoods would further limit a bird that already is uncommon and patchily distributed. Dispersal abilities by Bachman's Sparrows are unknown, but may be limited. If limited, isolated pockets of habitat would tend to lose their populations through time with little chance of their being restored. Severe disruption of its habitats would require a long period for restoration. Unreclaimed mined land would probably never succeed to a condition approximating the original open flatwoods with its understory of wire grass, palmettos, and shrubs. With proper management, habitats suitable for this species might be created in reclamation.

Selected References:

*Howell, A. H. 1932. Florida bird life. Coward-McCann, Inc., New York. 579 pp.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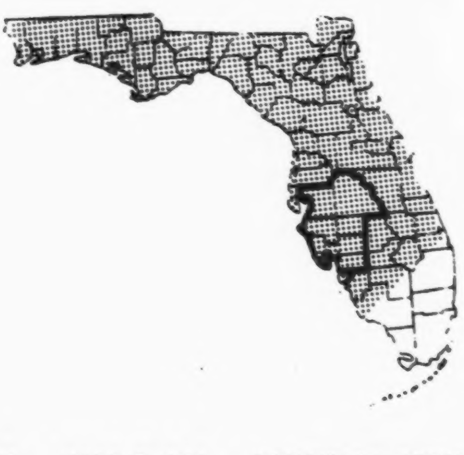


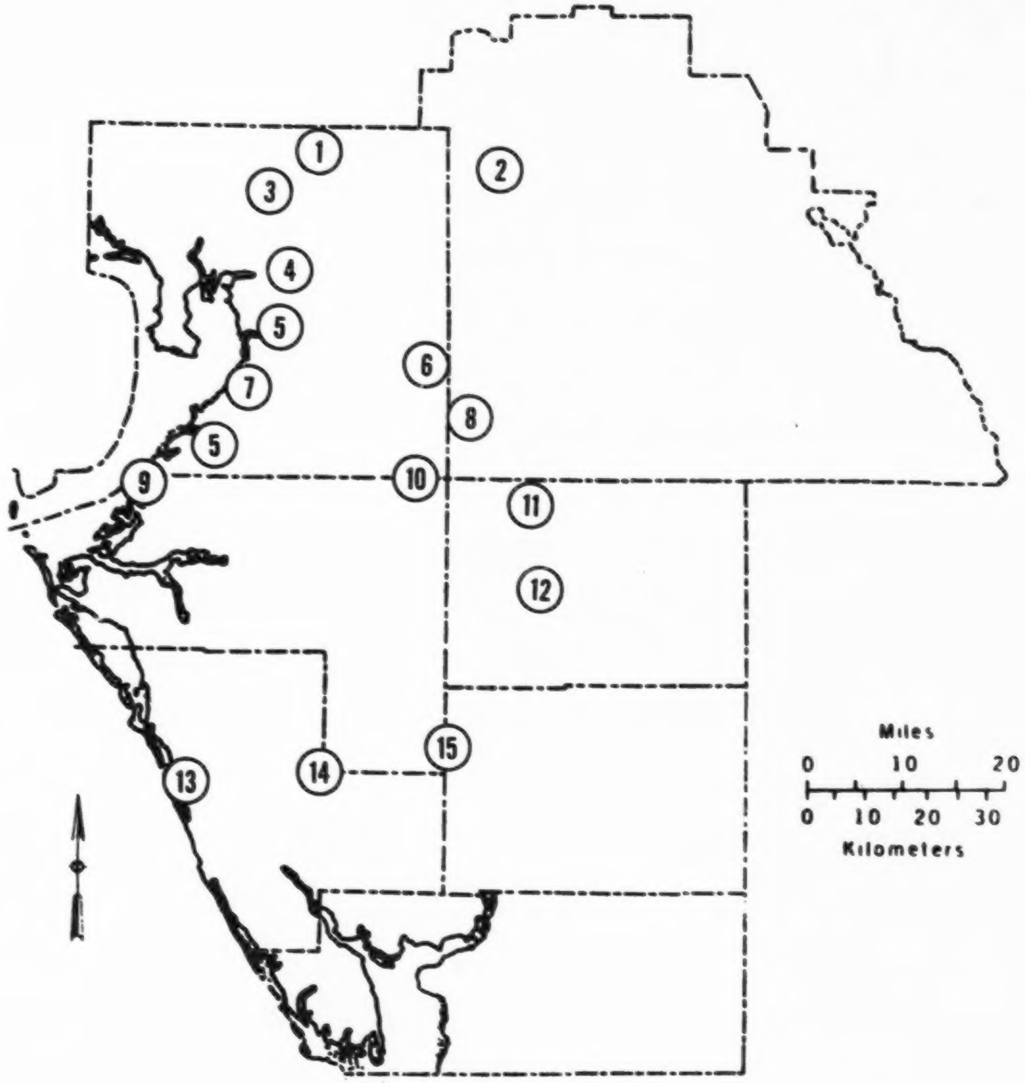
Fig. VIII.D.161. BACHMAN'S SPARROW (Aimophila aestivalis)

E. Mammals

Fifty-one species of mammals are listed from the seven-county area (Table VIII.E.1). This number includes all land mammals known from the region plus the two marine species - Manatee (Trichechus manatus) and Bottle-nosed Dolphin (Tursiops truncatus) - that regularly occur in nearshore coastal waters of the area. Other marine mammals, which are known only from sporadic strandings or occasional sightings and are typically offshore dwellers, were not included in this survey on the assumption that for all practical purposes phosphate mining or related activities would have no potential impact on their status.

Information on the distribution, habitat relationships, and population status of mammals of the seven-county area is scattered through a large number of sources and is, for the most part, fragmentary. There have been no long-term, intensive studies of the mammals of particular localities or habitats within the study area, and quantitative data on actual population densities and other details are sparse. Most of the available data pertaining specifically to the seven-county region is in the form of general surveys, often not much more than a listing of species, conducted by environmental consultants in connection with mining applications, real estate development projects, and power plant site studies. In addition, two checklists of mammals, for Myakka River State Park and Hillsborough River State Park, are available from the seven-county area. Principal sources of mammal data from within the study area are listed below (numbers are keyed to Fig. VIII.E.1 which shows the localities of these studies):

(1) Stevenson 1967, (2) J. B. Funderburg pers. comm., (3) Brown 1974, (4) Murray-McCormick Environ. Group 1974, (5) Dames and Moore 1975,



1. Hillsborough River State Park
2. Orange Park mine area
3. Lower Hillsborough Flood Detention Area
4. Lamonte-Shimberg Bloomingdale tract
5. Alafia and Little Manatee rivers
6. IMC Kingsford mine
7. Beacon Key
8. Borden Big Four mine
9. Big Bend Station, Tampa Elec. Co.
10. W. R. Grace property
11. C. F. Mining Corp. property
12. Mississippi Chem. Co. property
13. Oscar Scherer State Park
14. Myakka River State Park
15. Phillips Petroleum Co. property

Fig. VIII.E.1. Sites of principal data sources for mammals within the seven-county area. (See text for identification of sources.)

(6) Int. Minerals and Chem. Corp. 1974, (7) Long 1975, (8) Borden Phosphate 1975, (9) Long and Wunderlin 1975, (10) Conservation Consultants, Inc. 1975, (11) CF Mining Corp. 1976, (12) Mississippi Chem. Corp. 1976, (13) K. C. Alvarez pers. comm., (14) Fla. Dept. Nat. Res. 1976, K. C. Alvarez pers. comm., (15) Phillips Petroleum Co. 1975.

Eleven mammals of the seven-county area are listed on one or more rare and endangered species lists (Table VIII.E.2). Two (Florida Panther, _Felis concolor coryi_, and Manatee) out of five Florida species listed as endangered by the U.S. Department of the Interior occur in the seven-county area. Based on numbers of alleged sightings of panthers in different parts of the state, one of the three most likely population centers of this critically endangered species in Florida is the Myakka River Valley. Census data suggest that perhaps 17 to 19 percent of the total Manatee population of the United States inhabits the coastal waters and lower reaches of larger rivers of the seven-county area. Portions of these waters have been declared Critical Habitat for this species by the U. S. Department of the Interior.

Five (25 percent) of the species are among the 20 mammals considered as endangered or threatened by the Florida Game and Fresh Water Fish Commission, and 11 (30 percent) are among the 36 Florida mammals listed as endangered, threatened, rare, species of special concern, or status undetermined by the Florida Committee on Rare and Endangered Plants and Animals. Two (Florida Panther and Manatee) are included on the world list of rare and endangered species of the International Union for the Conservation of Nature and Natural Resources (IUCN).

Besides the 11 listed species, an additional 23 mammals are also regarded as priority species (Table VIII.E.1). These include two species of commercial value as furbearers, six hunted for sport (game), and two with both sport and commercial value as furbearers. An additional 13 species are included as biologically significant because of their zoogeographic, ecological, or taxonomic interest or value as indicators of environmental conditions.

Distribution of species by county is given in Table VIII.E.3. The number of species of land mammals, including introduced forms (exotics) and questionable county records, recorded from each county ranges from 21 in Charlotte to 47 in Hillsborough. In part, these differences reflect the extent of collecting and number of studies in various counties. However, they are also partly due to actual variation in the number of species present, as some species found in the northern part of the seven-county area do not reach the southern part.

Of the 49 land mammals presently known from the study area, 39 (80 percent) are native species and 10 (20 percent) are established exotics. (The Nine-banded Armadillo, Dasypus novemcinctus, is here considered an exotic, although the species has naturally invaded the Florida panhandle from the west.) About 80 percent of all native land mammals of the state occur in the seven-county area.

The mammalian fauna of the seven-county area is of interest in several respects. A portion of the study area forms part of the Central Florida Highlands biogeographic region, one of seven major biogeographic regions of Florida recognized by Neill (1957). This region, which includes the ridge section of Polk County, is characterized by a number of endemic species which are restricted to the xeric sand pine scrub and sandhill habitats. The Florida Mouse (Peromyscus floridanus) is a member of this endemic species group.

A rather high number, 20 percent, of species reach the southern limits of their ranges in western peninsular Florida in the seven-county area. These include the Southeastern Shrew (*Sorex longirostris*), Rafinesque's Big-eared Bat (*Plecotus rafinesquii*), Big Brown Bat (*Eptesicus fuscus*), Southeastern Pocket Gopher (*Geomys pinetis*), Eastern Harvest Mouse (*Reithrodontomys humulis*), Florida Mouse (*Peromyscus floridanus*), Golden Mouse (*Ochrotomys nuttalli*), and Eastern Woodrat (*Neotoma floridana*).

Two subspecies, the mole *Scalopus aquaticus bassi* and Cotton Mouse *Peromyscus gossypinus restrictus*, were originally described from the study area. The type localities are Englewood and Chadwick Beach (Sarasota County), respectively. The Chadwick Beach Cotton Mouse is known only from that locality, and its present status is uncertain. Part of the range of another coastal subspecies with a greatly restricted distribution, the Insular Cotton Rat (*Sigmodon hispidus insulicola*), also extends into the study area. The zone of intergradation between Sherman's Fox Squirrel (*Sciurus niger shermani*) and the Mangrove Fox Squirrel (*S. n. avicennia*) may also lie in the seven-county area. Finally, the seven-county region is in the transition zone between north Florida with relatively many bat species and south Florida with few bat species.

Regarding the exotic species of the region, apparently the only established population of Coyotes (*Canis latrans*) in Florida exists in the seven-county area (Polk County), and Nutria (*Myocastor coypus*) colonies in dairy farm ponds near Brandon, Hillsborough County, may be the densest populations of this introduced species in the state.

The ecological distribution and relative abundance of mammals of the seven-county area are summarized in Table VIII.E.4. Based on habitat requirements of listed species and the rarer, habitat-specific biologically significant species, critical mammalian habitat types in the seven-county area include swamp forests of various types, marshes and wet prairies, sand pine scrub, sandhills, and mature pine flatwoods with low herbaceous ground cover.

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Table VIII.E.1. Mammals, excluding offshore marine species, recorded from the seven-county area. Species assigned priority status are preceded by an asterisk and followed by the priority category and page number of the account. Two subspecies of species occurring in the area that are of special significance are listed in parentheses following the species name. Exotic species are designated by (E). Common and scientific names and their sequence follow Jones et al. (1975). Priority status categories are: species appearing on rare and endangered species lists (Listed), game species (Game), species of commercial importance (Commer.), and species of particular biological significance (Bio. Sig.).

Common Name	Scientific Name	Priority Status	Page
*VIRGINIA OPOSSUM	Didelphis virginiana	Commer.	1098
*SOUTHEASTERN SHREW	Sorex longirostris longirostris	Listed	1102
*SHORT-TAILED SHREW	Blarina brevicauda	Bio. Sig.	1106
LEAST SHREW	Cryptotis parva		
EASTERN MOLE	Scalopus aquaticus		
SOUTHEASTERN MYOTIS	Myotis austroriparius		
EASTERN PIPISTRELLE	Pipistrellus subflavus		
*BIG BROWN BAT	Eptesicus fuscus	Listed	1109
RED BAT	Lasiurus borealis		
SEMINOLE BAT	Lasiurus seminolus		
*NORTHERN YELLOW BAT	Lasiurus intermedius	Bio. Sig.	1112
EVENING BAT	Nycticeius humeralis		
*RAFINESQUE'S BIG-EARED BAT	Plecotus rafinesquii	Listed	1116
BRAZILIAN FREE-TAILED BAT	Tadarida brasiliensis		
*NINE-BANDED ARMADILLO (E)	Dasypus novemcinctus	Bio. Sig.	1119
*MARSH RABBIT	Sylvilagus palustris	Game	1122
*EASTERN COTTONTAIL	Sylvilagus floridanus	Game	1126
BLACK-TAILED JACK RABBIT (E)	Lepus californicus		
*GRAY SQUIRREL	Sciurus carolinensis	Game	1131
*SHERMAN'S FOX SQUIRREL	Sciurus niger shermani	Listed	1135
SOUTHERN FLYING SQUIRREL	Glaucomys volans		
*SOUTHEASTERN POCKET GOPHER	Geomys pinetis	Bio. Sig.	1140
MARSH RICE RAT	Oryzomys palustris		
*EASTERN HARVEST MOUSE	Reithrodontomys humulis	Bio. Sig.	1144
OLDFIELD MOUSE	Peromyscus polionotus		
COTTON MOUSE	Peromyscus gossypinus		
*(CHADWICK COTTON MOUSE	Peromyscus gossypinus restrictus)	Bio. Sig.	1147
*FLORIDA MOUSE	Peromyscus floridanus	Listed	1149
*GOLDEN MOUSE	Ochrotomys nuttalli	Bio. Sig.	1153
HISPID COTTON RAT	Sigmodon hispidus		
*(INSULAR COTTON RAT	Sigmodon hispidus insulicola)	Listed	1156
*EASTERN WOODRAT	Neotoma floridana	Bio. Sig.	1159
*ROUND-TAILED MUSKRAT	Neofiber alleni	Listed	1163
BLACK RAT (E)	Rattus rattus		
NORWAY RAT (E)	Rattus norvegicus		
HOUSE MOUSE (E)	Mus musculus		
*NUTRIA (E)	Myocastor coypus	Bio. Sig.	1167
*BOTTLE-NOSED DOLPHIN	Tursiops truncatus	Bio. Sig.	117

Table VIII.E.1. concluded

Common Name	Scientific Name	Priority Status	Page
*COYOTE (E)	Canis latrans	Bio. Sig.	1174
*RED FOX (E)	Vulpes vulpes	Bio. Sig.	1177
*GRAY FOX	Urocyon cinereoargenteus	Game	1181
*FLORIDA BLACK BEAR	Ursus americanus floridanus	Listed	1185
*RACCOON	Procyon lotor	Game/Commer.	1190
*FLORIDA LONG-TAILED WEASEL	Mustela frenata peninsulae	Listed	1194
EASTERN SPOTTED SKUNK	Spilogale putorius		
*STRIPED SKUNK	Mephitis mephitis	Commer.	1198
*RIVER OTTER	Lutra canadensis	Game/Commer.	1202
*FLORIDA PANTHER	Felis concolor coryi	Listed	1206
JAGUARUNDI (E)	Felis yagouaroundi		
*BOBCAT	Felis rufus	Bio. Sig.	1213
*MANATEE	Trichechus manatus	Listed	1217
*WILD HOG (E)	Sus scrofa	Game	1223
*WHITE-TAILED DEER	Odocoileus virginianus	Game	1228

Table VIII.E.2. Status categories for listed mammals. Categories are based on the following sources: United States Department of the Interior, 1977 (USDI); Florida Game and Fresh Water Fish Commission, 1977 (FGFWFC); Florida Committee on Rare and Endangered Plants and Animals, 1976 (FCREPA); and International Union for Conservation of Nature and Natural Resources, 1972 (IUCN). Status categories used are as follows: Endangered (End.), Vulnerable (Vul.), Threatened (Thrt.), Species of Special Concern (Spec.), Rare, Status Undetermined (Und.).

Common Name	USDI	FGFWFC	FCREPA	IUCN
SOUTHEASTERN SHREW			Rare	
BIG BROWN BAT			Rare	
RAFINESQUE'S BIG-EARED BAT			Rare	
SHERMAN'S FOX SQUIRREL		Thrt.	Thrt.	
FLORIDA MOUSE		Thrt.	Thrt.	
(INSULAR COTTON RAT)			Und.	
ROUND-TAILED MUSKRAT			Spec.	
FLORIDA BLACK BEAR		Thrt.	Thrt.	
FLORIDA LONG-TAILED WEASEL			Rare	
FLORIDA PANTHER	End.	End.	End.	End.
MANATEE	End.	Thrt.	Thrt.	Vul.

Table VIII.E.3. County records for mammals recorded from the seven-county area. Priority species indicated by an asterisk and exotic species designated by E. Subspecies of special significance listed in parentheses. Question mark indicates that the identification or locality is uncertain.

Common Name	County						
	Charlotte	DeSoto	Hardee	Hillsborough	Manatee	Polk	Sarasota
*VIRGINIA OPOSSUM	X	X	X	X	X	X	X
*SOUTHEASTERN SHREW	-	-	-	?	-	X	-
*SHORT-TAILED SHREW	-	X	X	X	X	X	X
LEAST SHREW	-	X	-	X	X	X	X
EASTERN MOLE	X	X	X	X	X	X	X
SOUTHEASTERN MYOTIS	X	-	-	X	X	-	X
EASTERN PIPISTRELLE	-	-	-	X	X	X	X
*BIG BROWN BAT	X	-	-	X	X	X	X
RED BAT	-	-	X	X	-	X	-
SEMINOLE BAT	-	-	X	X	X	X	X
*NORTHERN YELLOW BAT	X	X	X	X	X	X	X
EVENING BAT	X	-	-	X	X	X	X
*RAFINESQUE'S BIG-EARED BAT	-	-	-	X	-	-	-
BRAZILIAN FREE-TAILED BAT	X	-	-	X	-	X	X
*NINE-BANDED ARMADILLO (E)	X	X	X	X	X	X	X
*MARSH RABBIT	X	X	X	X	X	X	X
*EASTERN COTTONTAIL	X	X	X	X	X	X	X
BLACK-TAILED JACK RABBIT (E)	-	-	-	X	-	-	X
*GRAY SQUIRREL	-	X	X	X	X	X	X
*SHERMAN'S FOX SQUIRREL	X	X	X	X	X	X	X
SOUTHERN FLYING SQUIRREL	-	-	-	X	X	X	X
*SOUTHEASTERN POCKET GOPHER	-	X	X	X	X	X	-
MARSH RICE RAT	-	X	X	X	X	X	X
*EASTERN HARVEST MOUSE	-	X	-	X	X	X	X
OLDFIELD MOUSE	-	-	-	X	-	X	-
COTTON MOUSE	X	X	X	X	X	X	X
*(CHADWICK COTTON MOUSE)	-	-	-	-	-	-	X
*FLORIDA MOUSE	-	-	-	X	?	X	X
*GOLDEN MOUSE	-	X	-	X	X	X	-
HISPID COTTON RAT	X	X	X	X	X	X	X
*(INSULAR COTTON RAT)	-	-	-	-	-	-	?
*EASTERN WOODRAT	X	X	X	X	X	X	X
*ROUND-TAILED MUSKRAT	-	X	-	X	X	X	X
BLACK RAT (E)	-	-	X	X	X	X	X
NORWAY RAT (E)	-	-	-	X	-	?	-
HOUSE MOUSE (E)	X	-	X	X	X	X	X
*NUTRIA (E)	-	-	?	X	-	X	-

Table VIII.E.3. concluded

Common Name	County						
	Charlotte	DeSoto	Hardee	Hillsborough	Manatee	Polk	Sarasota
*BOTTLE-NOSED DOLPHIN	X	-	-	X	X	-	X
*COYOTE (E)	-	X	-	-	-	X	-
*RED FOX (E)	-	X	X	X	X	X	X
*GRAY FOX	-	X	X	X	X	X	X
*FLORIDA BLACK BEAR	?	X	?	-	?	?	X
*RACCOON	X	X	X	X	X	X	X
*FLORIDA LONG-TAILED WEASEL	-	-	X	X	X	X	X
EASTERN SPOTTED SKUNK	X	X	-	X	X	X	X
*STRIPED SKUNK	-	X	X	X	X	X	X
*RIVER OTTER	-	X	-	X	X	X	X
*FLORIDA PANTHER	?	?	-	?	?	?	?
JAGUARUNDI (E)	-	-	-	?	-	-	-
*BOBCAT	-	X	X	X	X	X	X
*MANATEE	X	X	-	X	X	-	X
*WILD HOG (E)	X	X	X	X	X	X	X
*WHITE-TAILED DEER	X	X	X	X	X	X	X

Table VIII.E.4. Habitat distribution and relative abundance of mammals in the seven-county area. Man-modified habitats are indicated by shading. Relative abundance categories and abbreviations: Abundant (A), Common (C), Uncommon (U), Rare (R), Very Rare (V), Population status questionable (S), Questionable habitat assignment (?).

Common Name	Habitat Type																														
	Pine-Turkey Oak	Sand Pine Scrub	Scrubby Flatwoods	Typical Flatwoods	Cabbage Palm Hammock	Live Oak Hammock	Mesic Hammock	Groves/Parklands/etc.	Hardwood Swamp	Cypress Swamp	Mangrove Swamp	Artificial Swamp	Bay Forest	Dry Brushland	Swamp Thicket	Dry Prairie	Pasture/Cropland/etc.	Wet Prairie	Freshwater Marsh	Artificial Marsh	Salt Marsh	Dunes/Beaches/Flats	Artificial Barrenland	Urban	Lakes/Ponds	Rivers/Streams	Springs	Artif. Fresh Waters	Coastal/Bays/Estuaries	Offshore	Artif. Salt Waters
*VIRGINIA OPOSSUM	C	A	U	C	C	C	C	C	A	C	U	C	C	U	C	U	U	U	U	U	R	U	U	U	-	-	-	-	-	-	-
*SOUTHEASTERN SHREW	-	-	-	-	-	-	-	-	V	-	-	-	V	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*SHORT-TAILED SHREW	-	-	-	R	-	-	-	-	U	-	-	-	R	-	-	-	R	-	R	-	-	-	-	-	-	-	-	-	-	-	-
LEAST SHREW	-	-	-	C	-	-	-	-	U	V	-	-	-	C	-	C	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EASTERN MOLE	C	U	-	C	-	C	U	C	-	-	-	-	-	C	-	C	C	-	-	-	-	-	-	C	-	-	-	-	-	-	-
SOUTHEASTERN MYOTIS	S	-	-	-	-	-	S	S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	C	-	-	-	-	-	-	-
EASTERN PIPISTRELLE	-	-	-	-	-	-	S	S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S	-	-	-	-	-	-	-
*BIG BROWN BAT	-	S?	-	-	-	-	-	S?	-	S?	-	-	-	-	-	-	-	-	-	-	-	-	-	V	-	-	-	-	-	-	-
RED BAT	S	-	-	-	-	-	S	S	-	-	-	-	-	-	-	-	S	-	-	-	-	-	-	-	S	S	-	-	-	-	-
SEMINOLE BAT	-	-	-	-	-	-	S	S	-	S	-	-	-	S	-	-	-	-	-	-	-	-	-	S	S	S	-	-	-	-	-
*NORTHERN YELLOW BAT	C?	-	-	A?	-	C	-	S	S	C	-	-	-	-	-	-	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EVENING BAT	-	U	-	C	C	C	C	C	C	C	-	-	-	-	-	-	-	-	-	-	-	-	-	S	-	-	-	-	-	-	-
*RAFINESQUE'S BIG-EARED BAT	-	-	-	-	-	V	S?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BRAZILIAN FREE-TAILED BAT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	C	-	-	-	-	-	-	-
*NINE-BANDED ARMADILLO (E)	U	U	U	C	A	A	A	A	C	U	-	-	C	C	U	C	C	U	U	U	-	U	U	U	-	-	-	-	-	-	-
*MARSH RABBIT	-	R	-	U	U	-	U	-	U	U	-	-	-	-	C	-	U	C	C	C	C	-	-	-	-	-	-	-	-	-	-
*EASTERN COTTONTAIL	C	C	C	A	U	U	U	C	R	U	C	-	-	C	-	C	A	U	-	-	-	C	U	C	-	-	-	-	-	-	-
BL.-TAILED JACK RABBIT (E)	-	-	-	-	-	-	-	V	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*GRAY SQUIRREL	R	U	-	U	C	C	A	C	A	U	-	-	-	-	-	-	-	-	-	-	-	-	-	C	-	-	-	-	-	-	-
*SHERMAN'S FOX SQUIRREL	R	V	-	U	V	-	-	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SOUTHERN FLYING SQUIRREL	C	C	-	U	U	C	C	U	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S	-	-	-	-	-	-	-
*SOUTHEASTERN POCKET GOPHER	A	C	C	C	-	U	-	C	-	-	-	-	-	C	-	-	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MARSH RICE RAT	-	-	-	R	-	-	-	-	U	-	C	-	U	-	C	-	C	-	C	C	C	-	-	-	C	-	-	-	-	-	-
*EASTERN HARVEST MOUSE	-	-	-	U	-	-	-	-	-	-	-	-	-	-	-	U	U	U	R	-	-	-	-	-	-	-	-	-	-	-	-
OLDFIELD MOUSE	U	U	U	-	-	-	-	C	-	-	-	-	-	-	-	-	C	-	-	-	-	-	C	-	-	-	-	-	-	-	-
COTTON MOUSE	U	U	U	U	C	C	A	C	A	C	R	-	C	R	C	-	-	-	R	-	R	R	-	-	-	-	-	-	-	-	-
*(CHADWICK COTTON MOUSE)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S	-	-	-	-	-	-	-	-	-
*FLORIDA MOUSE	U	C	U	-	-	U	-	-	-	V	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*GOLDEN MOUSE	-	-	-	-	U	-	-	-	C	S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HISPID COTTON RAT	U	U	U	A	U	R	R	R	U	U	U	U	U	C	C	A	A	C	C	C	C	U	-	-	-	-	-	-	-	-	-
*(INSULAR COTTON RAT)	-	-	-	-	-	-	-	-	-	-	-	-	S?	-	-	-	-	-	-	-	-	S?	-	-	-	-	-	-	-	-	-
*EASTERN WOODRAT	-	-	-	-	-	-	U	-	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table VIII.E.4. concluded

Common Name	Pine-Turkey Oak	Sand Pine Scrub	Scrubby Flatwoods	Typical Flatwoods	Cabbage Palm Hammock	Live Oak Hammock	Mesic Hammock	Groves/Parklands/etc.	Hardwood Swamp	Cypress Swamp	Mangrove Swamp	Artificial Swamp	Bay Forest	Dry Brushland	Swamp Thicket	Dry Prairie	Pasture/Cropland/etc.	Wet Prairie	Freshwater Marsh	Artificial Marsh	Salt Marsh	Dunes/Beaches/Flats	Artificial Barrenland	Urban	Lakes/Ponds	Rivers/Streams	Springs	Artif. Fresh Waters	Coastal/Bays/Estuaries	Offshore	Artif. Salt Waters
*ROUND-TAILED MUSKRAT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S?	U	U	-	S?	-	-	-	U	-	-	-	-	-	-
BLACK RAT (E)	-	S	-	C	-	-	R	-	S	-	U	-	-	-	-	-	C	-	-	-	-	-	-	A	-	-	-	-	-	-	-
NORWAY RAT (E)	-	-	-	-	-	-	U	-	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	U	-	-	-	-	-	-	-
HOUSE MOUSE (E)	-	-	-	U	-	-	-	-	-	-	U	-	-	-	-	-	C	-	U	-	-	-	U	A	-	-	-	-	-	-	-
*NUTRIA (E)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	V	-	-	-	-	-
*BOTTLE-NOSED DOLPHIN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	C	C	-
*COYOTE (E)	S	S	-	-	-	-	-	S	-	-	-	-	-	-	-	-	S	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*RED FOX (E)	C	U	-	-	-	-	-	-	C	-	-	-	-	U	-	U	C	-	-	-	-	-	-	U	-	-	-	-	-	-	-
*GRAY FOX	-	-	-	U	-	U	-	R	-	-	-	-	-	-	-	-	R	-	-	-	-	-	-	R	-	-	-	-	-	-	-
*FLORIDA BLACK BEAR	-	-	-	V	V	-	-	V	V	-	-	-	-	-	V	V	V	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*RACCOON	U	U	U	A	C	C	C	C	A	C	C	C	-	U	C	U	C	C	A	C	C	C	S	C	C	C	S	C	-	-	-
*FLORIDA LONG-TAILED WEASEL	S	-	S	V	V	V	V	V	V	-	-	-	-	-	-	-	V	-	V	-	-	-	-	-	-	-	-	-	-	-	-
EASTERN SPOTTED SKUNK	U	S	-	U	-	-	S	-	-	-	-	-	-	R	-	C	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*STRIPED SKUNK	-	-	-	C	-	U	U	U	U	-	-	-	-	U	-	U	U	-	-	-	-	-	-	S	-	-	-	-	-	-	-
*RIVER OTTER	-	-	-	-	-	-	-	-	U	U	U	U	-	-	-	-	-	U	U	U	-	-	-	-	C	C	-	C	U	-	U
*FLORIDA PANTHER	-	-	-	S	S	S	S	S	S	S	-	-	-	-	-	-	S	S	-	-	-	-	-	-	-	-	-	-	-	-	-
JAGUARUNDI (E)	-	S?	-	-	-	-	S?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*BOBCAT	S	U	S	C	C	C	C	U	C	U	C	-	C	C	-	S	U	S	U	-	-	U	-	-	-	-	-	-	-	-	-
*MANATEE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	C	-	U	C	S	U
*WILD HOG (E)	-	-	-	C	C	C	C	-	C	-	-	-	-	-	C	C	C	C	C	-	-	-	-	-	-	-	-	-	-	-	-
*WHITE-TAILED DEER	U	U	U	C	C	U	C	-	U	U	-	-	U	U	U	C	C	C	C	-	-	-	-	-	-	-	-	-	-	-	-

Commercial

VIRGINIA OPOSSUM | *Didelphis virginiana* Kerr

Order Marsupialia | Family Didelphidae

Distribution: The opossum occurs throughout the seven-county area, records existing for all of the counties. The species ranges throughout mainland Florida and occurs on at least some of the Florida Keys (Layne 1974). It is present in most of the United States east of the Rocky Mountains, along the Pacific coast (introduced), and southward through Central and South America (Hall and Kelson 1959).

Habitat: As elsewhere in Florida, the opossum occurs in a wide range of habitats in the seven-county area. It is likely to be found in any terrestrial environment, although it tends to prefer moister, wooded associations. In the seven-county area, records in pine flatwoods outnumber those from any other habitat type, but the species has been frequently recorded in dry and moist woodlands, swamps, marshes and wet prairies, and a great variety of man-modified habitats.

Population Status: This species is abundant throughout the seven-county area. It has been listed as abundant in the Lower Hillsborough Flood Detention Area (Brown 1974), Myakka River State Park (Fla. Dept. Nat. Res. 1976), and the Lamonte-Shimberg Bloomingdale tract (Murray-McCormick Environ. Group 1974). Stevenson (1967) regarded it as common in Hillsborough River State Park. Brown (1974) recorded densities ranging from 0 to 5 (mean = 2.1) per acre in different seasons and habitats in the Lower Hillsborough Flood Detention Area. Highest densities (3-5/acre) were in mixed swamp forest and lowest (0-2/acre) in pine flatwoods. Long (1975) found the species more frequent in areas around an old homesite and a pond than in coastal scrub or sand flats.

Basis for Priority Status: The opossum is considered a commercial species due to its value in the fur trade. Incomplete fur harvest data from 1937 through 1970(excluding the 1939-40, 1940-41, and 1962-63 seasons) show the annual number of opossums taken to range from 72 in the 1948-49 season to 8339 in the 1947-48 season. The mean number of individuals harvested during that 30-year period was approximately 1900 per year. During 1963 through 1970, reduced harvesting occurred and annual take was only 70. None was reported from 1970-1975. In the 1975-76 season,690 were known to be harvested (J. Brady pers. comm.).

Potential Impacts of Mining: Because of its broad habitat tolerance, the opossum would not be expected to be significantly affected by phosphate mining activities. It is a common resident of old, unreclaimed mined lands and most types of lands produced in reclamation.

Selected References:

*Brown, L. N. 1974. Mammalian faunal assessment, Pages 67-80 in Cowell, B. C., et al., Biological assessment of the Lower Hillsborough Flood Detention Area for recommendation of ecologically based land management. Univ. of So. Fla., Tampa. 111 pp.

*Florida Department of Natural Resources. 1976. Vertebrates of Myakka River State Park. 26 pp.

*Hall, E. R., and K. R. Kelson. 1959. The mammals of North America. 2 vols. Ronald Press, New York. 1083 pp.

*Layne, J. N. 1974. The land mammals of south Florida, Pages 386-413 in Gleason, P. J., ed., Environments of south Florida: present and past. Miami Geol. Soc. Memoir 2. 452 pp.

*Long, R. W. 1975. A biological assessment of Beacon Key, Florida. Tampa Elec. Co. Unpubl. MS. 264 pp.

*Murray-McCormick Environmental Group of Florida. 1974. Bloomingdale development of regional impact application. Prep. for Lamonte-Shimberg Corp., Tampa, Florida.

*Stevenson, J. A. 1967. A list of the vertebrates identified in Hillsborough River State Park. Fla. Brd. of Parks. 16 pp.

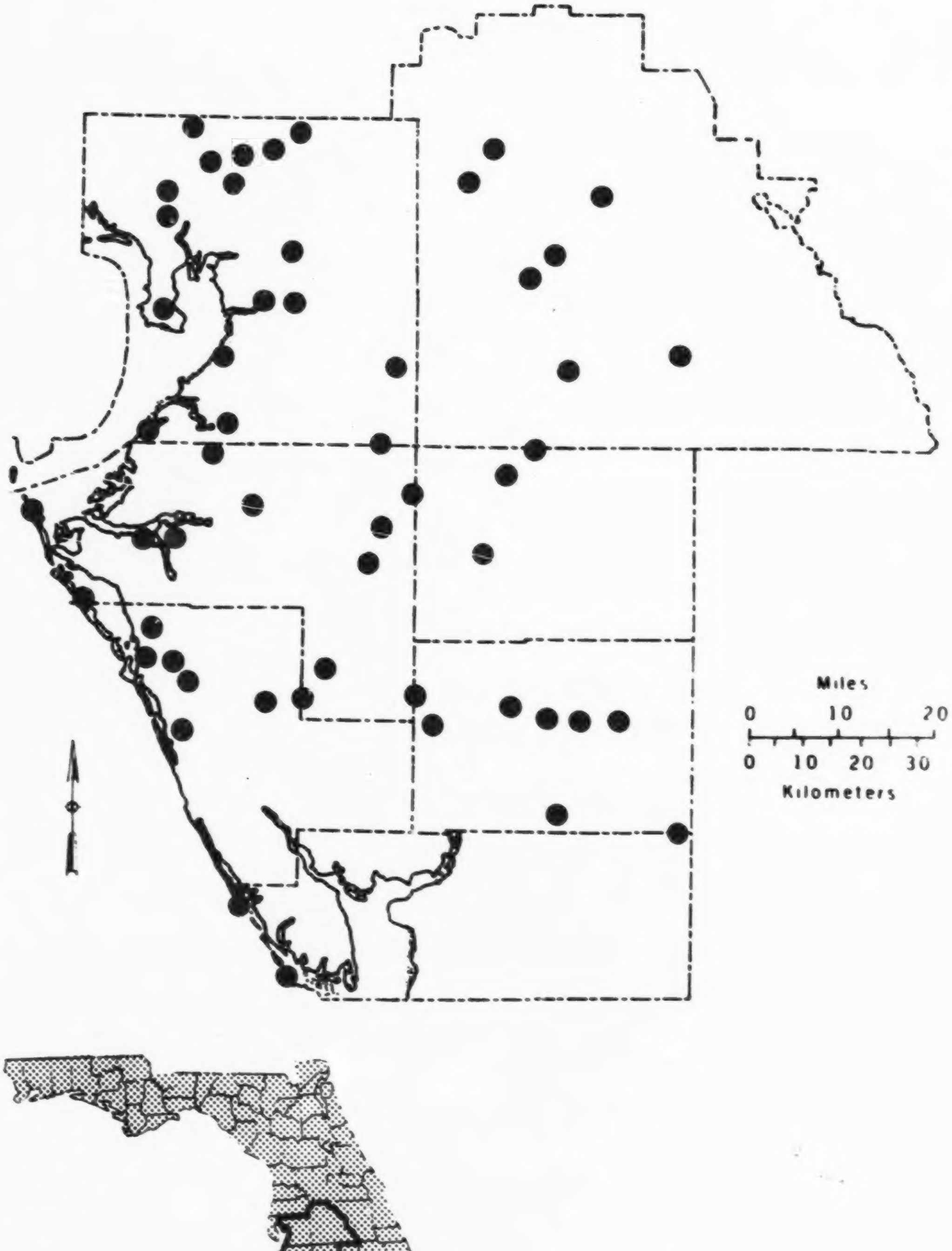
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Fig. VIII.E.2. VIRGINIA OPOSSUM (Didelphis virginiana)

Listed - Rare

SOUTHEASTERN SHREW _Sorex longirostris longirostris_ Bachman

Order Insectivora Family Soricidae

Other Names: Swamp Shrew, Bachman's Shrew

Distribution: The occurrence of the Southeastern Shrew in the seven-county area is based upon two verified records from Polk County and a questionable record from Hillsborough County. Hill (1945) collected a specimen (skin and skull no. 143190 in the mammal collection of the American Museum of Natural History) from Davenport, Polk County. In August-September 1977, four specimens were collected in pitfall traps along Tiger Creek, southeast of Lakes Wales (Polk County) by J. S. Godley (pers. comm.). The Hillsborough County record is based upon an entry in the catalog of the Epidemiology Research Laboratory of the State Department of Health and Rehabilitative Services referring to a specimen identified as _Sorex longirostris_ collected at Big Bend on 18 February 1964. The specimen was apparently not preserved.

The southernmost known locality of this species in Florida is Highlands County (J. N. Layne pers. comm). It has been recorded at scattered localities in northern Florida and occurs throughout the southeastern United States to northern Virginia and Illinois (Hall and Kelson 1959).

Habitat: The specimen collected by Hill (1945) was taken in a dense swamp, which was moist even in the dry winter season, bordering a shallow creek. The recent specimens from Tiger Creek were collected in a bayhead. Elsewhere in Florida the Southeastern Shrew generally has been recorded in moist, lowland forest situations, including swamp forest, moist river floodplain forest, bayhead swamp, dense palmetto and bay thicket, marginal thicket surrounding a mixed hardwood swamp, dense cypress-bay swamp, and a swampy area next to a lake (Brown 1976, McCauley and Layne 1975). However, in a recent study in north-central Florida this species was collected in a number of drier habitat types, including xeric hammock, sand pine scrub, pine flatwoods, and sandhills (Fla. Game and Fresh Water Fish Comm. 1976).

Population Status: This is an apparently very rare species throughout its Florida range, but this may be due to its extremely secretive habits and the difficulty of trapping it (Howell unpubl. MS, French unpubl. MS). It may thus actually be more abundant than available records suggest (Brown 1976). Twenty-four specimens were captured in sunken can traps in the mammal survey of the proposed Florida Barge Canal route (Fla. Game and Fresh Water Fish Comm. 1976). This is more than had been known from Florida previously.

Basis for Priority Status: The Southeastern Shrew is considered Rare by the Florida Committee on Rare and Endangered Plants and Animals due to the limited number of records of its occurrence in Florida.

Potential Impacts of Mining: Given the apparent rarity of the species in the seven-county area, phosphate mining probably would have no effect on its status. However, any destruction of swamp forests, bayheads, or other forest wetland habitats would reduce potential habitat for this shrew and carry with it some risk of eliminating as yet undiscovered populations.

Selected References:

*Brown, L. N. 1976. Southeastern Shrew, Pages 1077-1080 in Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

*Florida Game and Fresh Water Fish Commission. 1976. Cross-Florida Barge Canal restudy report: endangered, threatened, rare, special concern, status undetermined and biologically sensitive species. Dept. of the Army. Jacksonville Dist., Corps of Engineers. 267 pp.

*French, T. Report on status of the Southeastern Shrew, Sorex longirostris. Unpubl. MS. 3 pp.

*Hall, E. R., and K. R. Kelson. 1959. The mammals of North America. 2 vols. Ronald Press, New York. 1083 pp.

*Hill, J. E. 1945. Bachman's Shrew from Polk County, Florida. J. Mammal. 26: 88.

*Howell, A. H. Florida mammals. Unpubl. MS contained in the files of the U.S. Fish and Wildl. Serv., Washington, D.C. 114 pp.

*McCauley, M. N., and J. N. Layne. 1975. Sorex longirostris longirostris (Bachman, 1837), Sorex longirostris eionis (Davis, 1957). MS prep. for Fla. Game and Fresh Water Fish Comm. in connection with the Cross-Florida Barge Canal Restudy. 8 pp.

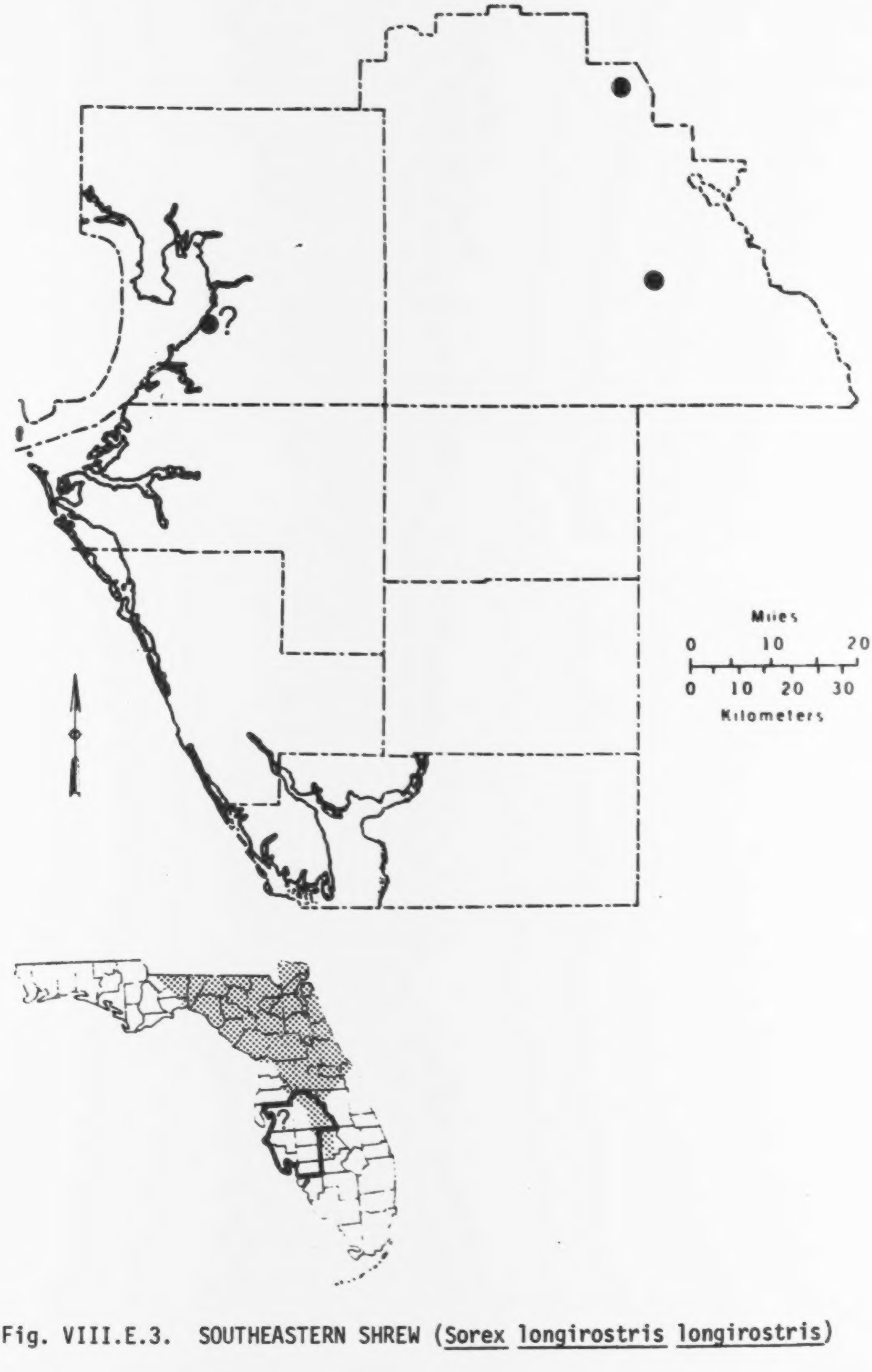
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Fig. VIII.E.3. SOUTHEASTERN SHREW (*Sorex longirostris longirostris*)

Biologically Significant

SHORT-TAILED SHREW — *Blarina brevicauda* Say

Order Insectivora — Family Soricidae

Other Names: Mole Shrew, Shrew-mouse

Distribution: Records of the Short-tailed Shrew exist for all counties in the seven-county area with the exception of Charlotte. This shrew occurs throughout Florida and the eastern half of the United States and southern Canada (Hall and Kelson 1959).

Habitat: The Short-tailed Shrew is found in a wide variety of habitats, from salt marshes along the coast to hydric hardwoods inland (Hamilton 1943). The preferred habitat appears to be damp forests supporting a dense leaf litter (Hamilton 1943). Wet meadows and overgrown fields are also frequented. Within the seven-county area, this species has been recorded from a variety of habitat types, including flatwoods, oldfields, hydric hammock, and freshwater marsh, with hydric hammock predominating.

Population Status: The Short-tailed Shrew is often abundant in suitable habitats but does not appear to be common in south Florida, although it may be more abundant and widespread than records indicate (Layne 1974). It appears to be locally distributed and uncommon within the seven-county area. Brown (1974) cited densities of 2 shrews per acre in fall, 1 per acre in winter, and 1 per acre in spring in flood plain forest of the Lower Hillsborough Flood Detention Area in Hillsborough County. Only 3 specimens were taken in 450 trapnights in hydric hardwoods in a Manatee-DeSoto County study area (Phillips Petroleum Co. 1975), and this species accounted for only 6 percent of small mammals trapped in winter and 0 percent in spring and fall in freshwater marsh and pine flatwoods habitats in the Little Manatee and Alafia river basins (Dames and Moore 1975).

Basis for Priority Status: Its preference for forested wetlands makes this species an important ecological indicator of these ecosystems.

Potential Impacts of Mining: Destruction of hardwood swamp, forested areas along rivers and creeks, bayheads, and similar wetland areas would decrease preferred habitat of the Short-tailed Shrew.

Selected References:

*Brown, L. N. 1974. Mammalian faunal assessment, Pages 67-80 in Cowell, B. C., et al., Biological assessment of the Lower Hillsborough Flood Detention Area for recommendation of ecologically based land management. Univ. of So. Fla., Tampa. 111 pp.

*Dames and Moore. 1975. Hydrobiologic assessment of the Alafia and Little Manatee rivers. Report prep. for the Southwest Fla. Water Management District by Dames and Moore, Consulting Engineers, Atlanta, Georgia.

*Hall, E. R., and K. R. Kelson. 1959. The mammals of North America. 2 vols. Ronald Press, New York. 1083 pp.

*Hamilton, W. J., Jr. 1943. The mammals of eastern United States; an account of Recent land mammals occurring east of the Mississippi. Comstock Press, Ithaca, New York. 432 pp.

*Layne, J. N. 1974. The land mammals of south Florida, Pages 386-413 in Gleason, P. J., ed., Environments of south Florida: present and past. Miami Geol. Soc. Memoir 2. 452 pp.

*Phillips Petroleum Company. 1975. DeSoto and Manatee counties. Development of regional impact application.

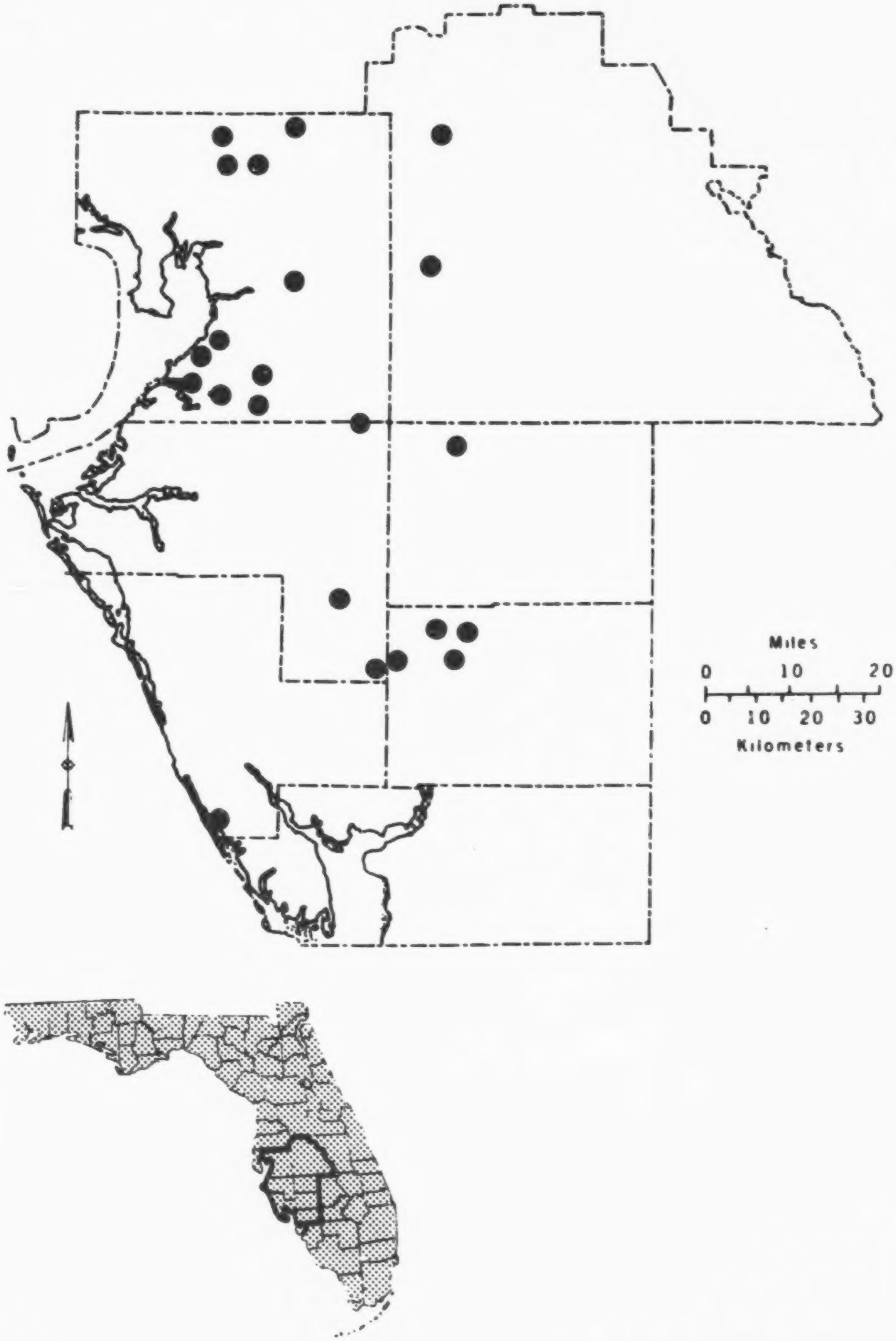
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Fig. VIII.E.4. SHORT-TAILED SHREW (Blarina brevicauda)

Listed - Rare

BIG BROWN BAT   *Eptesicus fuscus* (Palisot de Beauvois)

Order Chiroptera   Family Vespertilionidae

Distribution: Within the seven-county area, records of Big Brown Bats exist for all counties except DeSoto and Hardee. The species occurs throughout northern and central Florida southward to about the level of Lake Okeechobee. The overall range extends from Alaska and Canada south through the United States and Mexico to South America, including the Caribbean Islands (Barbour and Davis 1969).

The population occurring in the seven-county area is presumably the subspecies *Eptesicus fuscus osceola*, originally described from Tarpon Springs, Pinellas County. This race is considered by Hall and Kelson (1959) to occur throughout the area of peninsular Florida inhabited by the species. It is not impossible, however, that the northern subspecies, *E. f. fuscus*, may occur in the seven-county area as a straggler, winter resident, or migrant.

Habitat: Almost nothing is known of the habitat of the Big Brown Bat in the seven-county area. Sherman (1945) recorded specimens taken in buildings near Englewood, Sarasota County. Just east of the study area, in Highlands County, Rand and Host (1942) reported the occurrence of specimens in a dead tree in sand pine scrub habitat. In other parts of Florida and southeastern Georgia, the species has been recorded foraging over lakes, fields, pastures, and in residential areas, and cypress swamps (McCauley and Layne 1975). This species often roosts in buildings in company with Brazilian Free-tailed Bats (*Tadarida brasiliensis*).

Basis for Priority Status: The Big Brown Bat is listed as Rare by the Florida Committee on Rare and Endangered Plants and Animals because of the scarcity of records from Florida (Scudder and Humphrey 1976).

Potential Impacts of Mining: Phosphate mining would not be expected to have any significant impact on this species, considering its apparent rarity. Destruction of woodland areas could conceivably destroy hollow tree-inhabiting colonies and potential foraging habitats, but the probability of this is extremely low and for practical purposes can be ignored.

Selected References:

*Barbour, R. W., and W. H. Davis. 1969. Bats of America. Univ. Press of Kentucky, Lexington. 286 pp.

*Hall, E. R., and K. R. Kelson. 1959. The mammals of North America. 2 vols. Ronald Press, New York. 1083 pp.

Jennings, W. L. 1958. The ecological distribution of bats in Florida. Ph.D. Thesis, Univ. of Fla., Gainesville. 126 pp.

*McCauley, M. N., and J. N. Layne. 1975. _Eptesicus fuscus fuscus_ (Palisot de Beauvois, 1796), _Eptesicus fuscus osceola_ Rhoads, 1902. MS prep. for Fla. Game and Fresh Water Fish Comm. in connection with Cross-Florida Barge Canal restudy. 11 pp.

*Rand, A. L., and P. Host. 1942. Mammal notes from Highland (sic) County, Florida. Results Archbold Exped. No. 45. Bull. Amer. Mus. Nat. Hist. 80, Art. 1. 21 pp.

*Scudder, S. J., and S. R. Humphrey. 1976. Big Brown Bat, Pages 1087-1092 _in_ Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

*Sherman, H. B. 1945. Recent literature and some new distribution records concerning Florida mammals. Proc. Fla. Acad. Sci. 7: 199-202.

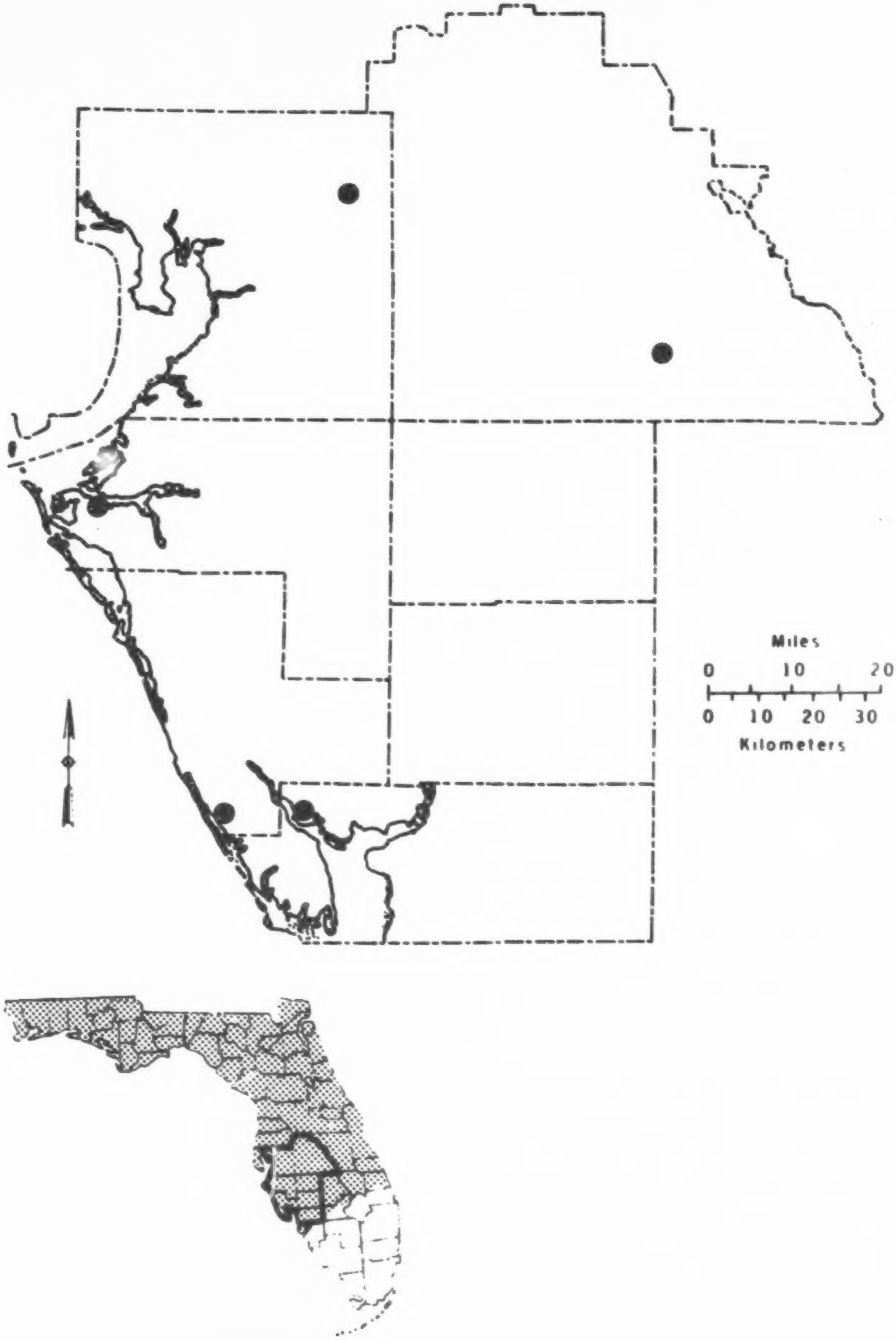
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Fig. VIII.E.5. BIG BROWN BAT (Eptesicus fuscus)

Biologically Significant

NORTHERN YELLOW BAT — *Lasiurus intermedius* H. Allen

Order Chiroptera — Family Vespertilionidae

Other Names: Eastern Yellow Bat, Florida Yellow Bat. The subspecies occurring in Florida and elsewhere in the southeastern United States is *Lasiurus intermedius floridanus*, formerly known as *Dasypterus floridanus*.

Distribution: Records of the Northern Yellow Bat exist for all counties in the seven-county area. This species occurs throughout Florida except the southern tip, infrequently reaching Miami along the east coast and not being known south of Lee County on the west coast (Layne 1974). The entire species range includes the Atlantic and Gulf coastal areas (in Texas inland to Austin) from southern Virginia to the Yucatan peninsula, including Cuba (Hall and Kelson 1959).

Habitat: This species is closely associated with Spanish moss (*Tillandsia usenoides*) in which it roosts and bears its young. Within the seven-county area it has been observed in cypress swamps, hammocks, hardwood swamp, citrus groves, and over oldfields. Open flatwoods is a typical habitat in nearby Highlands County (J. N. Layne pers. comm.). The species shows a tendency to aggregate and feed over areas with few shrubs and open stands of trees, and it has often been collected while flying over water (Jennings 1958).

Population Status: This species is locally common in many areas of the seven-county area. It is probably the most widely distributed and abundant bat in the region. In Polk, Hillsborough, Hardee, and Highlands counties, Yellow Bats made up 52 percent or more of bats collected during an intensive survey (Jennings 1958). Brown (1974) reported the species to be common in cypress swamps of the Lower Hillsborough Flood Detention Area, and it was listed as abundant on the Lamonte-Shimberg Bloomingdale tract near Brandon (Murray-McCormick Environ. Group 1974). There appears to be marked seasonal variation in abundance in the seven-county area, with the vast majority of the records being from the warmer months of the year.

Basis for Priority Status: The Northern Yellow Bat is largely dependent upon the presence of Spanish moss for roost and nursery sites, and relatively open areas for foraging. Suitable clumps of Spanish moss tend to be associated with mature trees. For this reason, this bat species is a good indicator of open woodland areas with mature trees. This large, handsome bat is also one of the unique elements of the Floridian mammal fauna.

Potential Impacts of Mining: Large-scale mining of open pine flatwoods and live oak hammocks with mature trees would probably reduce the population of this species. Yellow Bats might utilize unreclaimed mined areas which have succeeded to grasses or reclaimed areas in improved pasture if adequate roost and nursery sites were available.

Selected References:

Barbour, R. W., and W. H. Davis. 1969. Bats of America. Univ. Press of Kentucky, Lexington. 286 pp.

*Brown, L. N. 1974. Mammalian faunal assessment, Pages 67-80 in Cowell, B. C., et al., Biological assessment of the Lower Hillsborough Flood Detention Area for recommendation of ecologically based land management. Univ. of So. Fla., Tampa. 111 pp.

*Hall, E. R., and K. R. Kelson. 1959. The mammals of North America. 2 vols. Ronald Press, New York. 1083 pp.

*Jennings, W. L. 1958. The ecological distribution of bats in Florida. Ph.D. Thesis, Univ. of Fla., Gainesville. 126 pp.

*Layne, J. N. 1974. The land mammals of south Florida, Pages 386-413 in Gleason, P. J., ed., Environments of south Florida: present and past. Miami Geol. Soc. Memoir 2. 452 pp.

*Murray-McCormick Environmental Group of Florida. 1974. Bloomingdale development of regional impact application. Prep. for Lamonte-Shimberg Corp., Tampa, Florida.

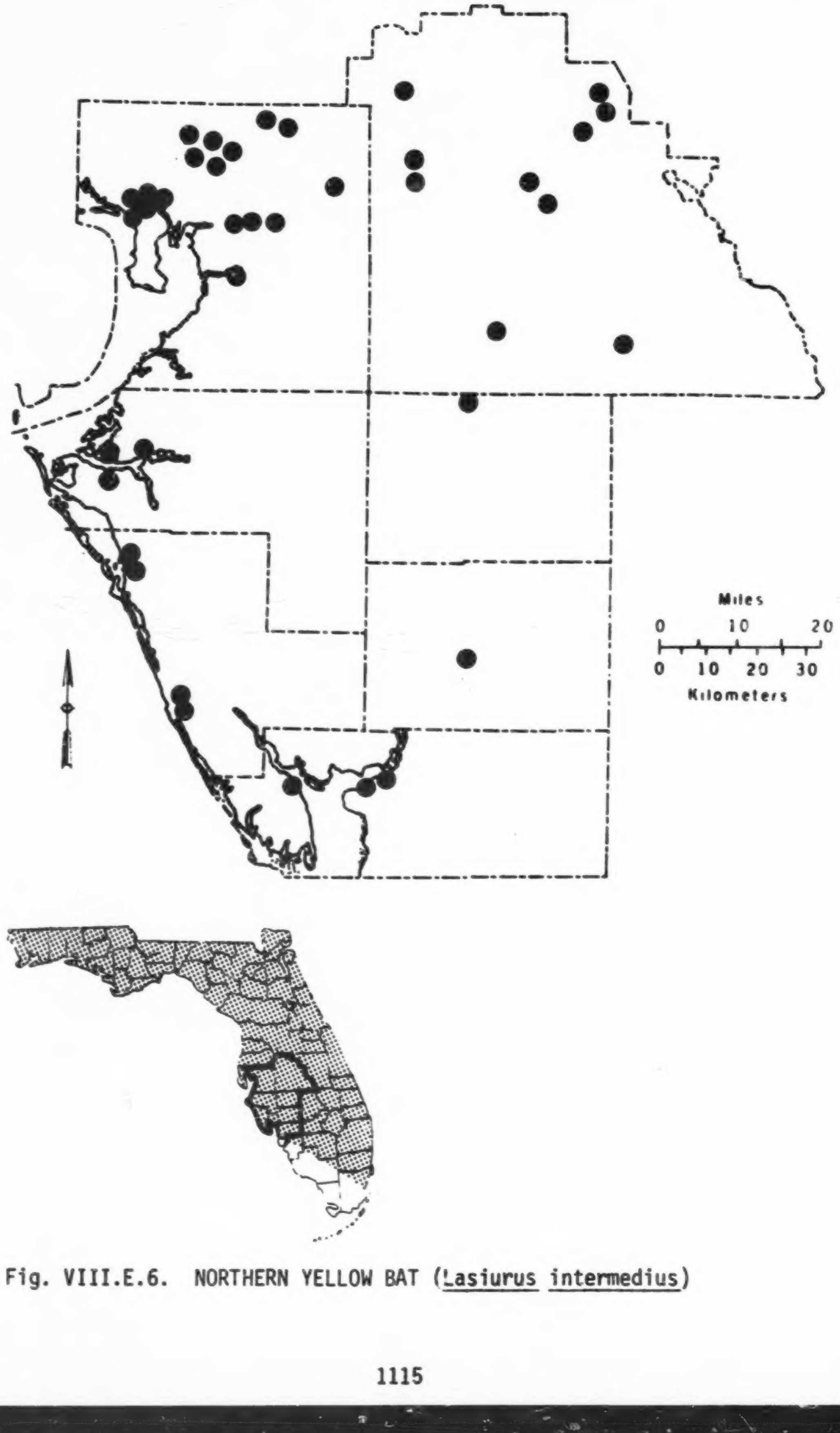
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Fig. VIII.E.6. NORTHERN YELLOW BAT (*Lasiurus intermedius*)

Listed - Rare

RAFINESQUE'S BIG-EARED BAT — *Plecotus rafinesquii* (Lesson)

Order Chiroptera — Family Vespertilionidae

Other Names: Rafinesque's Big-eared Bat, LeConte's Big-eared Bat, Eastern Big-eared Bat, Southeastern Big-eared Bat, Eastern Mule-eared Bat, Eastern Lump-nosed Bat. In earlier publications this species has been known as *Corynorhinus macrotis* and *Corynorhinus rafinesquii*.

Distribution: The southern limit of the range of Rafinesque's Big-eared Bat just reaches the seven-county area, and it has been recorded at only one locality in the region: the Lower Hillsborough Flood Detention Area, Hillsborough County (Brown 1974). A questionable record of this species from Highlands County, just east of the seven-county area, is incorrectly plotted in Hardee County on Brown's (1976) map. This species occurs in the northern half of peninsular Florida and northward to southern Ohio and central Indiana and west to southeastern Oklahoma (Barbour and Davis 1969). The subspecies occurring in Florida is *P. r. macrotis*.

Habitat: Forested regions with hammock-type vegetation are preferred by this species (Barbour and Davis 1969, Jennings 1958). It is also known to occur in hammocks, cypress bays, and over cultivated fields, and to utilize dilapidated buildings, hollow trees, and crevices behind loose bark for roost sites (Brown 1976, Harper 1927). The two specimens from Hillsborough County were found roosting in an olden wooden cabin in a live oak hammock in March and September 1973 (Brown 1974).

Population Status: Although Jennings (1958) believed this bat to be common in suitable habitats in Florida, Barbour and Davis (1969) concluded that it was nowhere abundant. It must be considered very rare in the seven-county area. The species may have a permanent colony in the Tampa Bay region, although intensive field work would be needed to verify this (Brown 1974).

Basis for Priority Status: This species is listed as Rare by the Florida Committee on Rare and Endangered Plants and Animals due to its overall scarcity and its secretive habits.

Potential Impacts of Mining: Phosphate mining would probably have no effect on the status of the Big-eared Bat in the seven-county area. However, mining of moist hammock areas would constitute loss of potential habitat for this species.

Selected References:

*Barbour, R. W., and W. H. Davis. 1969. Bats of America. Univ. Press of Kentucky, Lexington. 286 pp.

*Brown, L. N. 1974. Southern extension of the known range of *Plecotus rafinesquii*. Bat Res. News 15(1): 7-8.

*Brown, L. N. 1976. Southeastern Big-eared Bat, Pages 1096-1098 *in* Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

*Harper, F. 1927. The mammals of the Okefinokee Swamp region of Georgia. Proc. Boston Soc. Nat. Hist. 38: 191-396.

*Jennings, W. L. 1958. The ecological distribution of bats in Florida. Ph.D. Thesis, Univ. of Fla., Gainesville. 126 pp.

Worley, D. J., and J. N. Layne. 1975. *Plecotus rafinesquii* (Lesson 1818). MS prep. for Fla. Game and Fresh Water Fish Comm. in connection with the Cross-Florida Barge Canal Restudy. 10 pp.

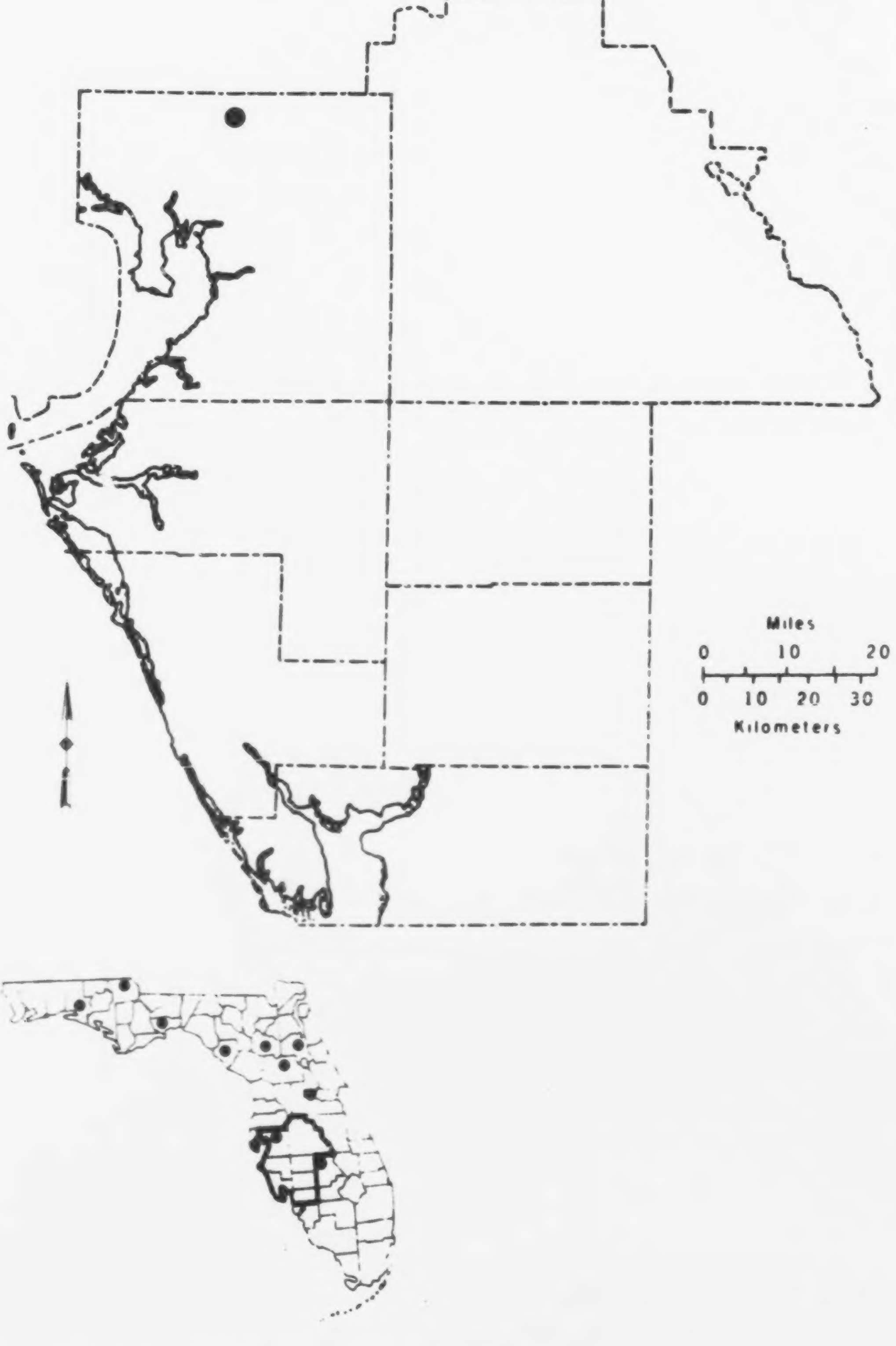
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Fig. VIII.E.7. RAFINESQUE'S BIG-EARED BAT (Plecotus rafinesquii)

Biologically Significant

NINE-BANDED ARMADILLO | *Dasypus novemcinctus* Linnaeus

Order Edentata | Family Dasypodidae

Distribution: The armadillo is found throughout the seven-county area, with actual records for all counties. This species was established in Florida from introductions on the Atlantic coast from about 1920 to 1936. Colonization has proceeded during the past 40 to 50 years, and currently armadillos inhabit essentially all of peninsular Florida, although they have not become established in the Everglades. The armadillo has undergone a natural range expansion during the past 100 years or so and is now present over much of the southern United States, although a hiatus of some 220 km exists in the Florida panhandle between the eastern introduced population and the natural invasion from the west (Humphrey 1974). However, this gap is being filled in and eventually the species will be continuously distributed throughout the southern United States.

Habitat: As elsewhere, armadillos in the seven-county area are found in a broad variety of habitats ranging from dry to moist and open to forested. They not only occupy many natural environments but occur commonly in various kinds of man-modified habitats, including built-up and old phosphate mine areas. The more frequently reported habitat types within the seven-county area include pine flatwoods, live oak hammocks, mesic hammocks, hardwood swamps, parklands, and oldfields.

Population Status: The Nine-banded Armadillo is generally common to abundant throughout the seven-county area, although quantitative data on population densities are lacking. Long (1975) presented information on relative abundance in different seasons and habitats at Beacon Key (Hillsborough County) based on tracks and digging signs along transects. Mean values (tracks or diggings per 1000 feet) for each habitat censused at three different periods were: coastal scrub, 0.8; sandflats, 0.4; grassland, 0.2; vicinity of pond, 0.3; woodland-scrub, 0.4. These data suggest higher populations in areas with woody cover. General observations elsewhere also indicate that this species tends to be most abundant in moist forested or mixed grassland-forested habitats. The armadillo apparently became established in the seven-county area in the late 1940's and early 1950's (Neill 1952).

Basis for Priority Status: Its rapid colonization of the state, ability to utilize numerous habitat types, and the fact that it probably competes with native species give the armadillo particular biological significance.

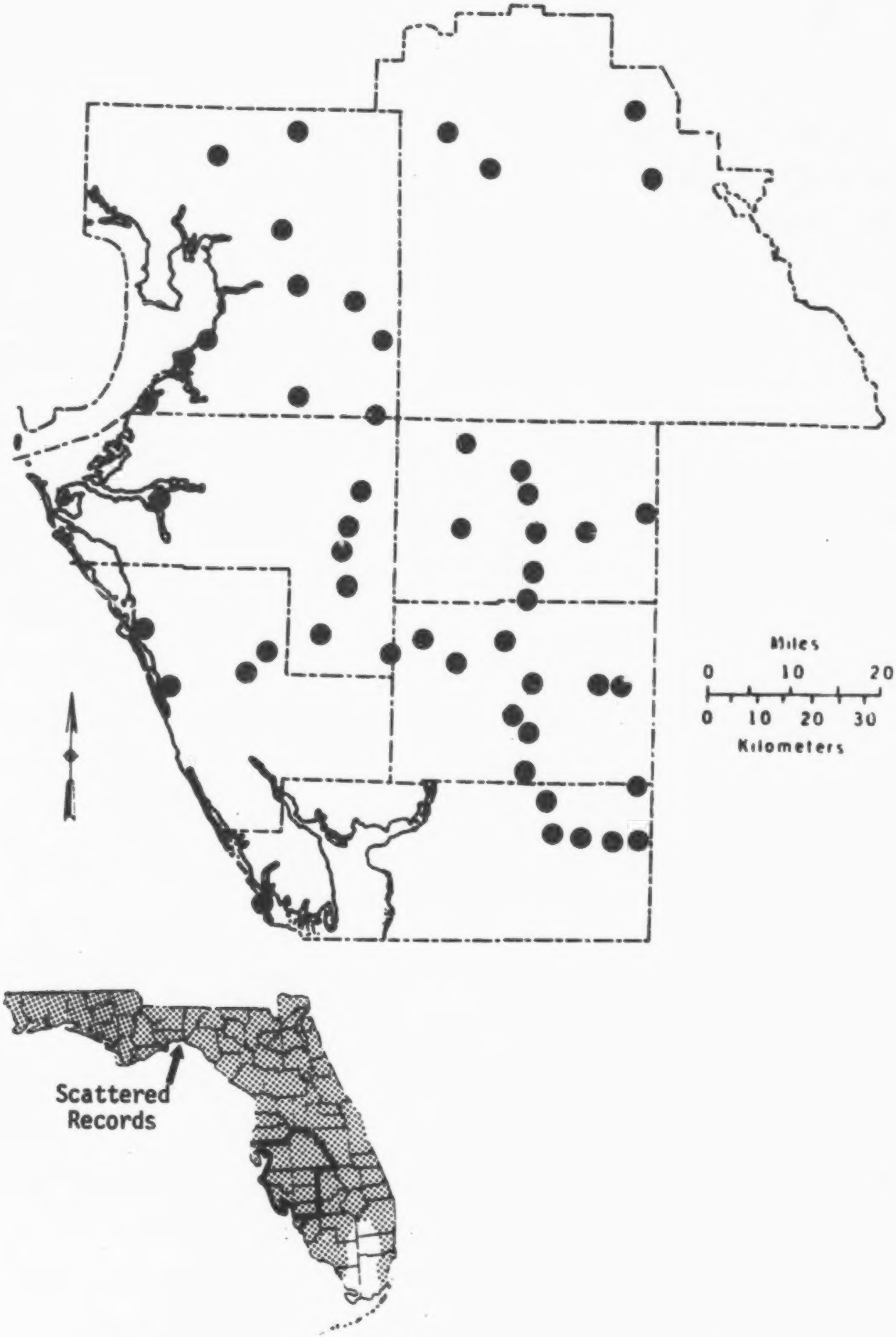
Potential Impacts of Mining: Mining activities would probably have no significant effect on this abundant and ubiquitous species.

Selected References:

*Humphrey, S. R. 1974. Zoogeography of the Nine-banded Armadillo (*Dasypus novemcinctus*) in the United States. Bio. Sci. 24(8): 457-462.

*Long, R. W. 1975. A biological assessment of Beacon Key, Florida. Tampa Elec. Co. Unpubl. MS. 264 pp.

*Neill, W. T. 1952. The spread of the armadillo in Florida. Ecology 33(2): 282-284.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Scattered Records

Fig. VIII.E.8. NINE-BANDED ARMADILLO (*Dasypus novemcinctus*)

Game

MARSH RABBIT Sylvilagus palustris Bachman

Order Lagomorpha Family Leporidae

Distribution: The Marsh Rabbit has been recorded from all counties in the seven-county area. It occurs throughout the Florida mainland, on nearshore islands, and on some of the Florida Keys. The overall range includes the Atlantic and Gulf coastal plains from southeastern Virginia through Florida and southern Georgia to Mobile Bay, Alabama (Stevenson 1976).

Habitat: This rabbit is typically associated with wet areas and dense cover (Layne 1974), although it occurs in a great variety of habitats. In the seven-county area, Marsh Rabbits have been recorded from habitat types ranging from xeric to hydric, including sand pine scrub, pine flatwoods, mangroves, freshwater marshes, oldfields, and along heavily vegetated ditches. J. B. Funderburg (pers. comm.) observed Marsh Rabbits at the Orange Park phosphate mine, Polk County.

Population Status: Workers who have commented on the population status of this species at different localities in the seven-county area have generally rated it as common or abundant in typical habitats (Brown 1974, Fla. Dept. Nat. Res. 1976, J. B. Funderburg pers. comm., Long 1975, Murray-McCormick Environ. Group 1974, Stevenson 1976). Brown (1974) cited an actual density figure of 1 per acre in winter in pine flatwoods. Halls and Stransky (1971) concluded that the Marsh Rabbit population in Florida was stable.

Basis for Priority Status: Marsh Rabbits are considered game species in Florida. The relative importance of the Marsh Rabbit as a game species is difficult to assess, as statistical data on rabbit hunting (harvests, hunter effort, etc.) compiled by the Florida Game and Fresh Water Fish Commission do not distinguish between this species and the Eastern Cottontail (*Sylvilagus floridanus*). However, because of the more restricted and often dense habitats of the Marsh Rabbit and its more secretive habits compared to the Cottontail, the latter species probably accounts for the bulk of the rabbits harvested in the state.

Potential Impacts of Mining: Mining of wet prairies, freshwater marshes, flatwoods ponds, and similar wetlands would reduce Marsh Rabbit habitat, but this would probably not seriously affect the over-all status of this species in the seven-county area. Wetland areas in unreclaimed mined areas are good habitats for Marsh Rabbits, and creation of shallow marshes or lake edges on reclaimed lands would also favor this species, which could easily be introduced into such habitats if unable to re-establish itself naturally.

Selected References:

*Brown, L. N. 1974. Mammalian faunal assessment, Pages 67-80 *in* Cowell, B. C., *et al*., Biological assessment of the Lower Hillsborough Flood Detention Area for recommendation of ecologically based land management. Univ. of So. Fla., Tampa. 111 pp.

*Florida Department of Natural Resources. 1976. Vertebrates of Myakka River State Park. 26 pp.

*Halls, L. K. and J. J. Stransky. 1971. Atlas of southern forest game. Southern Forest Experiment Sta., Forest Serv., U.S. Dept. of Agric. 24 pp.

*Layne, J. N. 1974. The land mammals of south Florida, Pages 386-413 *in* Gleason, P.J., ed., Environments of south Florida: present and past.

Miami Geol. Soc. Memoir 2. 452 pp.

*Long, R. W. 1975. A biological assessment of Beacon Key, Florida. Tampa Elec. Co. Unpubl. MS. 264 pp.

*Murray-McCormick Environmental Group of Florida. 1974. Bloomingdale development of regional impact application. Prep. for Lamonte-Shimberg Corp., Tampa, Florida.

*Stevenson, H. M. 1976. Vertebrates of Florida, identification and distribution. Univ. Presses of Fla., Gainesville. 607 pp.

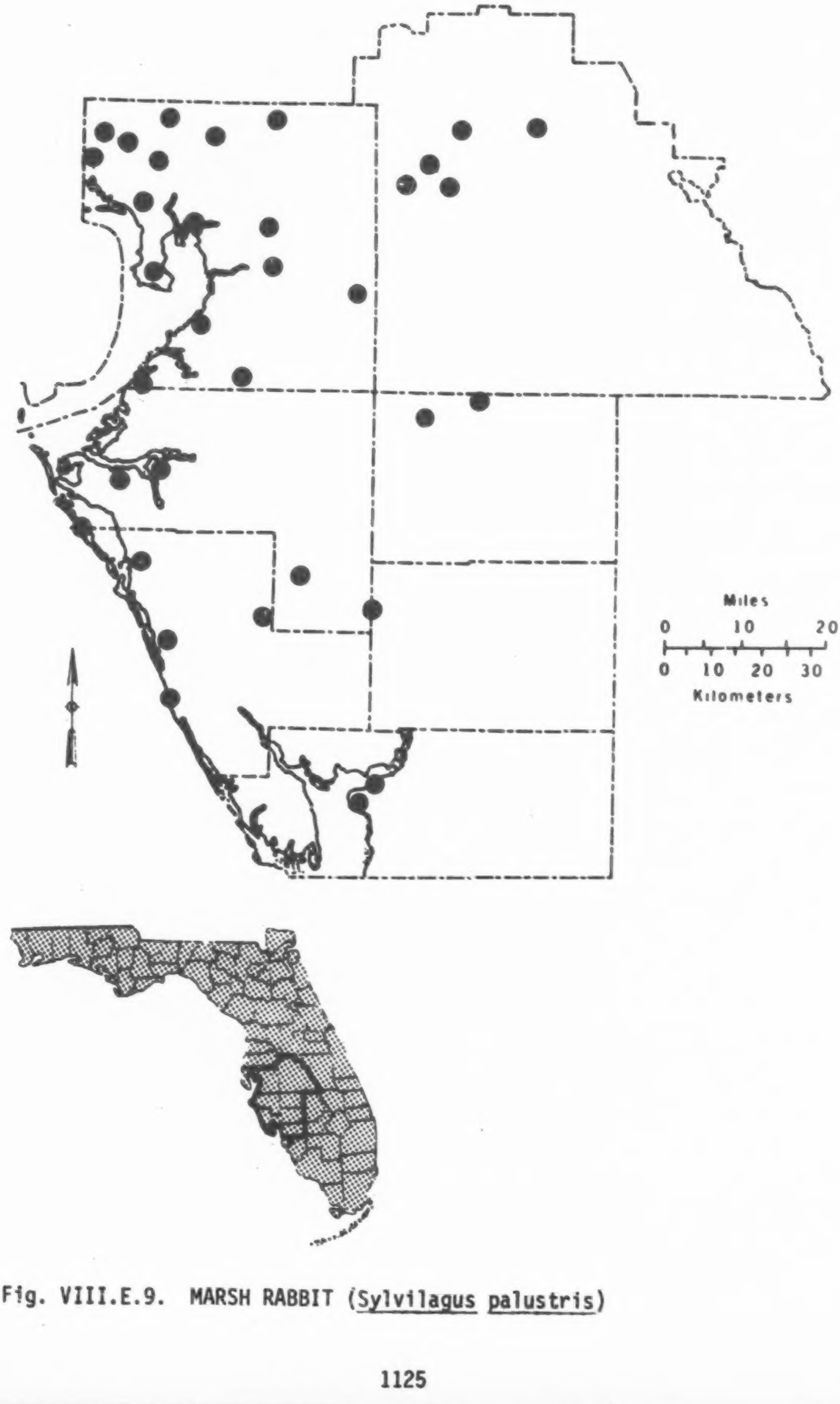
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Fig. VIII.E.9. MARSH RABBIT (Sylvilagus palustris)

Game

EASTERN COTTONTAIL *Sylvilagus floridanus* J. A. Allen

Order Lagomorpha Family Leporidae

Other Names: Cottontail Rabbit

Distribution: Records of the Cottontail exist for all counties in the seven-county area. This species is found throughout the state, although Layne (1974) notes that it does not occur in the Everglades and southwest portion of the peninsula. The overall range includes most of the United States east of the Rockies and southward into parts of Mexico and Central America (Hall and Kelson 1959).

Habitat: The Cottontail is typically found in dry, upland situations ranging from open fields to woodlands, although it tends to avoid heavily forested areas (Hamilton 1943). In the seven-county area, this species has been reported in numerous habitat types, the principal ones being pine flatwoods, sand pine scrub, oldfields, and developed areas. It is one of the common mammals in improved pastures. It is also present in some coastal habitats, including mangroves, coastal scrub, and sand flats (Long 1975).

Population Status: The Eastern Cottontail is generally common to abundant throughout the seven-county area. It is listed as abundant in Myakka River State Park (Fla. Dept. Nat. Res. 1976) and common in Hillsborough River State Park (Stevenson 1967), the Alafia and Little Manatee river basins (Dames and Moore 1975), the Lamonte-Shimberg Bloomingdale tract near Brandon (Murray-McCormick Environ. Group 1974), the Lower Hillsborough Flood Detention Area (Brown 1974), and the Mississippi Chemical Corporation property near Ona, Hardee County (Miss. Chem. Corp. 1976). However, it was reported as only occasional in an area along the South Prong of the Alafia River in Polk County (Borden Phosphate 1975), and J. B. Funderburg (pers. comm.) considered it rare in the Orange Park phosphate mine area in the period 1962-66. Density values given by Brown (1974) for oak scrub, pine flatwoods, and oldfield grasslands ranged from 0 to 2 per acre in different seasons. Halls and Stransky (1971) consider that the state-wide population of this species in Florida is stable.

Basis for Priority Status: The Cottontail is considered a game species in Florida. The fur also has some commercial value. As noted for the Marsh Rabbit, harvest and other hunting statistics for Florida do not distinguish between the Marsh Rabbit and Cottontail, although the latter probably accounts for the majority of rabbits killed and time expended in rabbit hunting. On a state-wide basis 45,353 ± 3579 Florida hunters pursued rabbits in 1975-76, harvesting an estimated 455,655 ± 55,340 animals. The South Region, which includes the seven-county area, accounted for about 29 percent of the number of hunters and 46 percent of the total harvest. Rabbits comprise about 6 percent of the harvest of all (13) game species for which data are compiled (Conklin 1977).

Potential Impacts of Mining: Phosphate mining will probably have little adverse effect on this species.

Selected References:

*Borden Phosphate. 1975. Big Four Mine. Development of regional impact application.

*Brown, L. N. 1974. Mammalian faunal assessment, Pages 67-80 *in* Cowell, B. C., *et al*., Biological assessment of the Lower Hillsborough

Flood Detention Area for recommendation of ecologically based land management. Univ. of So. Fla., Tampa. 111 pp.

*Conklin, E. J. 1977. Wildlife inventory, harvest and economic survey. Fla. Game and Fresh Water Fish Comm. Job Perform. Rept. 1-A-1. 12 pp.

*Dames and Moore. 1975. Hydrobiologic assessment of the Alafia and Little Manatee rivers. Report prep. for the Southwest Fla. Water Management District by Dames and Moore, Consulting Engineers, Atlanta, Georgia.

*Florida Department of Natural Resources. 1976. Vertebrates of Myakka River State Park. 26 pp.

*Hall, E. R., and K. R. Kelson. 1959. The mammals of North America. 2 vols. Ronald Press, New York. 1083 pp.

*Halls, L. K., and J. J. Stransky. 1971. Atlas of southern forest game. Southern Forest Experiment Sta., Forest Serv., U.S. Dept. of Agric. 24 pp.

*Hamilton, W. J., Jr. 1943. The mammals of eastern United States; an account of recent land mammals occurring east of the Mississippi. Comstock Press, Ithaca, New York. 432 pp.

*Layne, J. N. 1974. The land mammals of south Florida, Pages 386-413 in Gleason, P. J., ed., Environments of south Florida: present and past. Miami Geol. Soc. Memoir 2. 452 pp.

*Long, R. W. 1975. A biological assessment of Beacon Key, Florida. Tampa Elec. Co. Unpubl. MS. 264 pp.

*Mississippi Chemical Corporation. 1976. Ona, Hardee County. Development of regional impact application.

*Murray-McCormick Environmental Group of Florida. 1974. Bloomingdale development of regional impact application. Prep. for Lamonte-Shimberg Corp., Tampa, Florida.

*Stevenson, J. A. 1967. A list of the vertebrates identified in Hillsborough River State Park. Fla. Brd. of Parks. 16 pp.

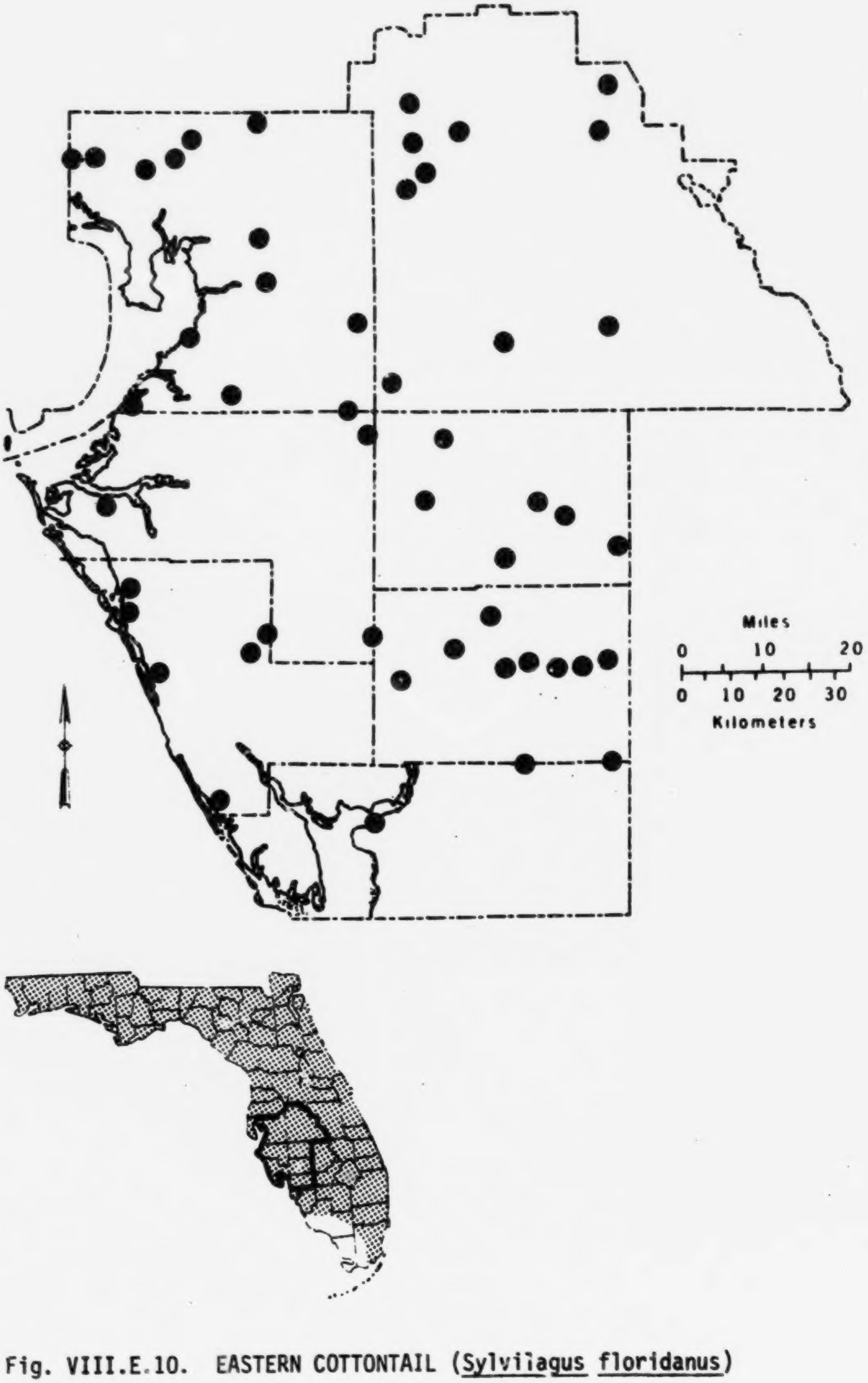
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Fig. VIII.E.10. EASTERN COTTONTAIL (*Sylvilagus floridanus*)

Game

GRAY SQUIRREL — *Sciurus carolinensis* Gmelin

Order Rodentia — Family Sciuridae

Other Names: Cat Squirrel

Distribution: The Gray Squirrel has been recorded in all counties in the seven-county area except Charlotte. It undoubtedly occurs in this county, the lack of records being a reflection of the sparsity of wildlife data from this area. Thomas (1973) observed the Gray Squirrel on the Montgomery Ranch, which included parts of DeSoto, Charlotte, and Highlands counties. The species occurs throughout most of Florida, including the upper Keys, and over the entire eastern United States (Hall and Kelson 1959).

Habitat: Gray Squirrels prefer heavily forested bottom lands and big stands of mature hardwoods with understories of smaller trees and shrubs (Halls and Stransky 1971). Within the seven-county area, the species has been recorded most frequently in hydric, mesic, and live oak hammocks and park-like areas.

Population Status: The species is generally common to abundant throughout much of the seven-county area (Brown 1974, Dames and Moore 1975, Fla. Dept. Nat. Res. 1976, Miss. Chem. Corp. 1976, Murray-McCormick Environ. Group 1974, Stevenson 1967). However, it was reported as rare at the Orange Park phosphate mine, Polk County in 1962-66 (J. B. Funderburg pers. comm.). Data on actual densities are given in two studies conducted in the seven-county area. Worley (1973) estimated average density as 6 squirrels per acre in a mesic hammock habitat in Hillsborough River State Park; and Brown (1974) cited densities during fall, winter, and spring in riverine floodplain forest and oak scrub in the Lower Hillsborough Flood Detention Area of 6 to 8 and 4 to 6, respectively. Halls and Stransky (1971) indicated a downward trend in the combined Fox and Gray Squirrel population in Florida.

Basis for Priority Status: The Gray Squirrel is an important game species in Florida. It is taken more frequently than the Fox Squirrel. The estimated state-wide harvest of both this species and the Fox Squirrel in 1975 was 1,012,470 which comprised about 14 percent of the total number of all Florida game species harvested (Conklin 1977). About 10 percent of the squirrels harvested in 1975 were taken in the South Region, which includes the seven-county area.

Potential Impacts of Mining: This arboreal species requires forested habitats and is particularly partial to lowland forests. In many parts of the seven-county area, suitable habitat is restricted to thin strands of hammock along stream courses. Mining would destroy substantial areas of Gray Squirrel habitat and probably result in a significantly reduced population of this species in the seven-county area. Acceptable habitats can be established on reclaimed land but would require years before they would reach a suitable stage.

Selected References:

*Brown, L. N. 1974. Mammalian faunal assessment, Pages 67-80 in Cowell, B. C., et al., Biological assessment of the Lower Hillsborough Flood Detention Area. Southwest Fla. Water Management District, Brooksville, Florida. 111 pp.

*Conklin, E. J. 1977. Wildlife inventory, harvest and economic survey. Fla. Game and Fresh Water Fish Comm. Job Perform. Rept. 1-A-1. 12 pp.

*Dames and Moore. 1975. Hydrobiologic assessment of the Alafia and Little Manatee rivers. Report prep. for the Southwest Fla. Water Management District by Dames and Moore, Consulting Engineers, Atlanta, Georgia.

*Florida Department of Natural Resources. 1976. Vertebrates of Myakka River State Park. 26 pp.

*Hall, E. R., and K. R. Kelson. 1959. The mammals of North America. 2 vols. Ronald Press, New York. 1083 pp.

*Halls, L. K., and J. J. Stransky. 1971. Atlas of southern forest game. Southern Forest Experiment Sta., Forest Serv., U. S. Dept. of Agric. 24 pp.

*Mississippi Chemical Corporation. 1976. Ona, Hardee County. Development of regional impact application.

*Murray-McCormick Environmental Group of Florida. 1974. Bloomingdale development of regional impact application. Prep. for Lamonte-Shimberg Corp., Tampa, Florida.

*Stevenson, J. A. 1967. A list of the vertebrates identified in Hillsborough River State Park. Fla. Brd. of Parks. 16 pp.

*Thomas, J. M. 1973. General biological survey Montgomery Ranch. Appendix 1. Deer Run application for a development of regional impact. Punta Gorda Isles, Inc.

*Worley, D. J. 1973. A seasonal study of the home range and population size of the Eastern Gray Squirrel, Sciurus carolinensis, in Hillsborough River State Park. Unpubl. MS. 17 pp.

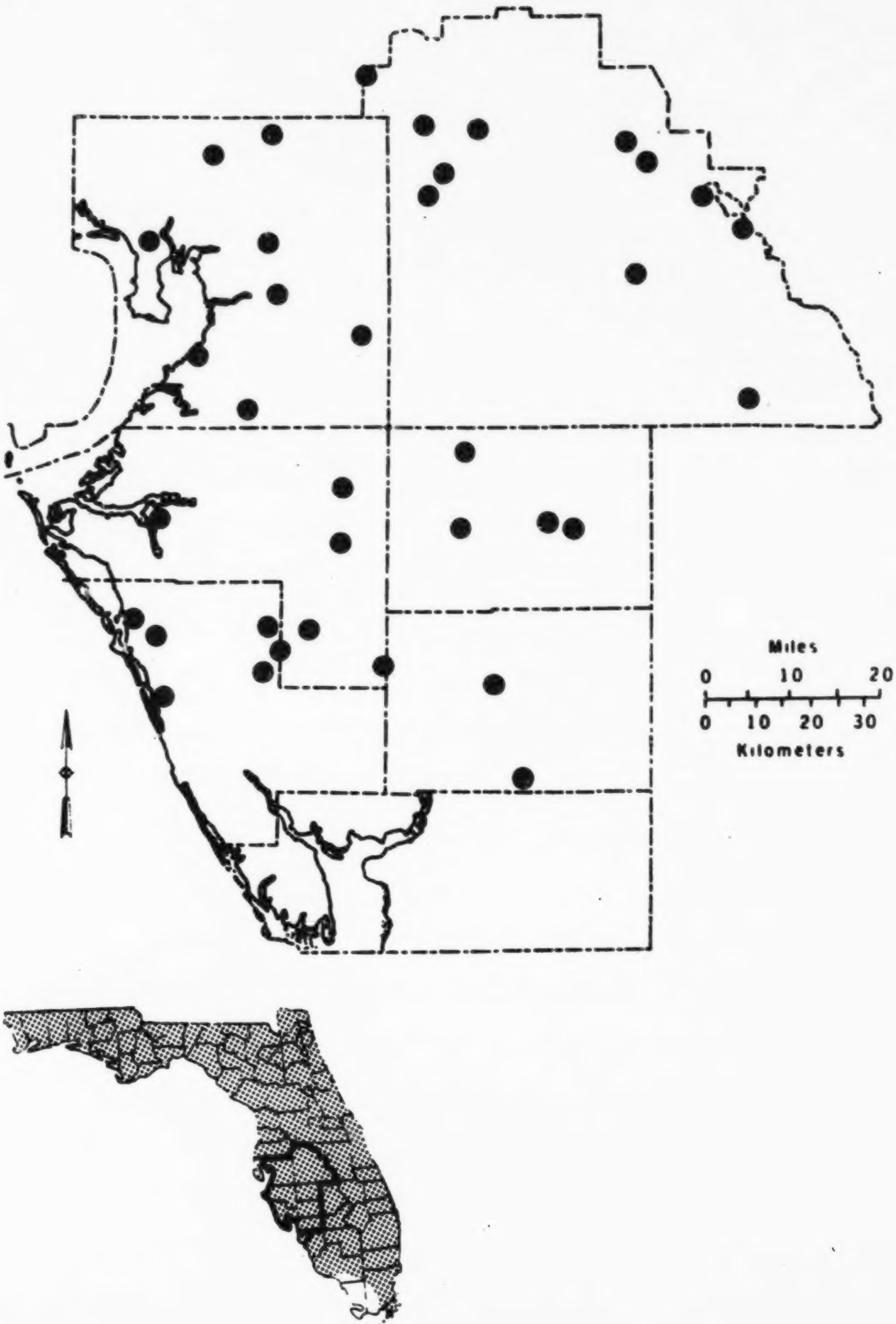
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Fig. VIII.E.11. GRAY SQUIRREL (Sciurus carolinensis)

Listed - Threatened

Game Species

SHERMAN'S FOX SQUIRREL Sciurus niger shermani Moore

Order Rodentia Family Sciuridae

Distribution: The Fox Squirrel ranges throughout the seven-county area, with actual records available for all counties. The taxonomic status of the population of this species within the study area is somewhat questionable. Moore (1956) shows the range of Sherman's Fox Squirrel (S. n. shermani) extending to about northern Hillsborough and Polk counties and apparently actually examined specimens from these two counties. The northern boundary of the range of the Mangrove Fox Squirrel (S. n. avicennia) of southern Florida is shown as the Caloosahatchee River. The intervening area, which includes most of the seven-county area, is designated as a hypothetical area of intergradation, although apparently no specimens from this region were actually studied. On a geographic basis, Fox Squirrels north of the Caloosahatchee River are probably more likely to be closer to shermani than avicennia, and superficial examination of specimens from this area indicates they do agree more with shermani in size and coloration. Thus, for the purpose of this report, the population of the seven-county area is regarded as the race S. n. shermani.

The northern range limit of shermani lies at about the Suwannee River (Moore 1956). Other races of the Fox Squirrel occur in the remainder of north Florida and extend northward to Pennsylvania and northern Minnesota and westward to western Nebraska, Kansas, and Texas (Hall and Kelson 1959).

Habitat: The longleaf pine-turkey oak or sandhills association is apparently the primary habitat of Sherman's Fox Squirrel. However, due to extensive logging, this habitat is much reduced and has been replaced mainly by turkey oak forests, a suboptimal habitat for Fox Squirrels. Probably mature flatwoods with low ground cover now constitute the best habitat for the species. In addition, Fox Squirrels may be found in ecotonal situations, such as on the margins of flatwoods cypress ponds and where bayhead meets pine flatwoods (Ehrhart 1976).

Within the seven-county area, Sherman's Fox Squirrel has been reported most frequently in pine flatwoods or improved pasture areas with open pine stands which give a park-like aspect. It also commonly inhabits live oak hammocks and occurs less often in sandhills and sand pine scrub. Established populations are also found on golf courses where large trees are present. Such a population was reported in Arcadia, DeSoto County (V. Messmer pers. comm.).

Population Status: Sherman's Fox Squirrel is declining in abundance throughout its peninsular Florida range, primarily as a result of habitat loss (Ehrhart 1976). Within the seven-county area it is rare to uncommon in suitable habitats. Stevenson (1967) regarded it as rare in Hillsborough River State Park, and it has only been recorded once (March 1977) in Myakka River State Park (K. C. Alvarez pers. comm.). Brown (1974) found it to be uncommon in pine flatwoods in the Lower Hillsborough Flood Detention Area and cited a maximum density of 2 per acre in spring. It was reported as uncommon on the Lamonte-Shimberg Bloomingdale tract near Brandon (Murray-McCormick Environ. Group 1974) and occasional in pine flatwoods pastures along the South Prong of the Alafia River in Polk County (Borden Phosphate 1975). A number of sighting records of this species have come from pine flatwoods and open live oak hammock habitats in western Hardee and DeSoto counties and eastern Manatee

County, suggesting the existence of a relatively good population in that portion of the seven-county area.

Basis for Priority Status: Sherman's Fox Squirrel is classified as Threatened by the Florida Game and Fresh Water Fish Commission and Florida Committee on Rare and Endangered Plants and Animals because loss of habitat has drastically reduced its numbers. This subspecies is still a legal game species. There appear to be no data available on harvests of this species in the seven-county area. With continued habitat destruction coupled with hunting, the prognosis is for a further decline in the population of this race.

Potential Impacts of Mining: Pine flatwoods and pastures with scattered pine and/or large oaks constitute a substantial proportion of the habitats on lands presently owned by phosphate companies, and it is assumed that much of these areas will be scheduled for mining. Extensive destruction of such habitats would be reflected in a significant decrease in Fox Squirrels within the seven-county area. As the seven-county area is believed to be one of the areas in the range of Sherman's Fox Squirrel still with comparatively good habitats and a relatively high population, reduction of this population would have an adverse impact on the status of the subspecies as a whole. Unreclaimed mined lands and most land-use types resulting from reclamation are unsuitable for this species. Although it would be comparatively easy to provide for re-establishment of Fox Squirrel habitat in reclamation programs, it would take many years before such areas reached a condition that would support the species.

Selected References:

*Borden Phosphate. 1975. Big Four Mine. Development of regional impact application.

*Brown, L. N. 1974. Mammalian faunal assessment, Pages 67-80 in Cowell, B. C., et al., Biological assessment of the Lower Hillsborough Flood Detention area for recommendation of ecologically based land management. Univ. of So. Fla., Tampa. 111 pp.

*Ehrhart, L. M. 1976. Sherman's Fox Squirrel, Pages 1032-1037 in Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

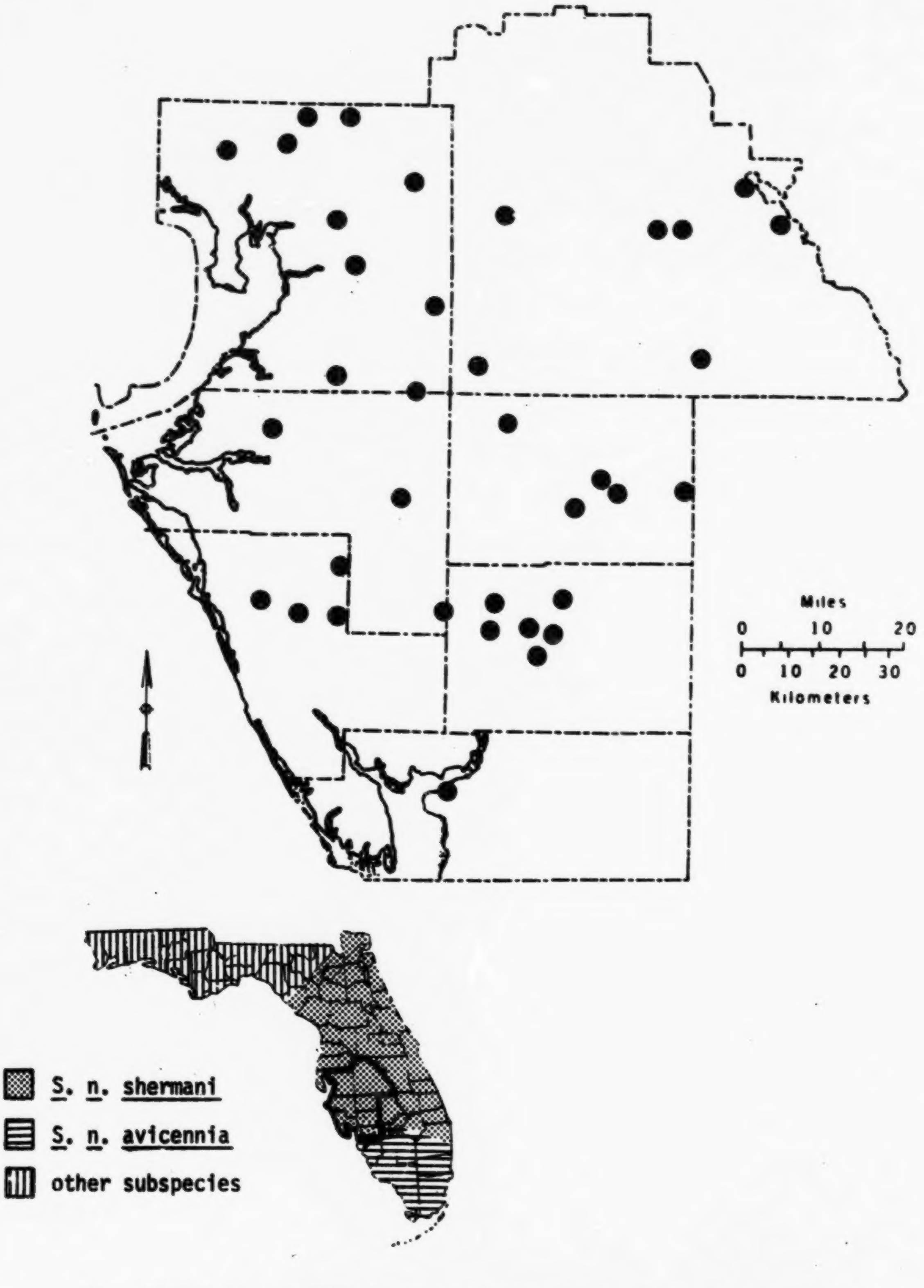
*Hall, E. R., and K. R. Kelson. 1959. The mammals of North America. 2 vols. Ronald Press, New York. 1083 pp.

*Moore, J. C. 1956. Variation in the Fox Squirrel in Florida. Am. Midl. Nat. 55(1): 41-65.

Moore, J. C. 1957. Natural history of the Fox Squirrel, *Sciurus niger shermani*. Bull. Amer. Mus. Nat. Hist. 113(1): 1-71.

*Murray-McCormick Environmental Group of Florida. 1974. Bloomingdale development of regional impact application. Prep. for Lamonte-Shimberg Corp., Tampa, Florida.

*Stevenson, J. A. 1967. A list of the vertebrates identified in Hillsborough River State Park. Fla. Brd. of Parks. 16 pp.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S. n. shermani
S. n. avicennia
other subspecies

Fig. VIII.E.12. SHERMAN'S FOX SQUIRREL (*Sciurus niger shermani*)

Biologically Significant

SOUTHEASTERN POCKET GOPHER — Geomys pinetis Rafinesque

Order Rodentia — Family Geomyidae

Distribution: The Southeastern Pocket Gopher has been reported from all counties within the seven-county area except Charlotte and Sarasota. Hubbell and Goff (1939) stated that scattered, isolated colonies occurred south to Charlotte County but gave no specific locality records. The absence of records from Sarasota County and the eastern portion of DeSoto County appears to reflect the actual distribution and not lack of observations. Geomys pinetis occurs from southern Georgia and Alabama southward through Florida to a line roughly extending from southern DeSoto County through central Highlands County to Brevard County (Hall and Kelson 1959, Rand and Host 1942, Woodruff 1973).

Habitat: The pocket gopher is restricted to dry, well-drained sandy soils. It reaches greatest abundance in the longleaf pine-turkey oak association of the central Florida sandhills (Hubbell and Goff 1939). Within the seven-county area, the species occurs most commonly in longleaf pine-turkey oak, drier pine flatwoods, and well-drained grasslands and road shoulders. Its presence in an area is advertised by the characteristic mounds of sand thrown up by its digging activities. The absence of records in Sarasota and Charlotte counties and eastern DeSoto County is correlated with the predominance of poorly drained soils in these areas.

Population Status: This fossorial rodent is common to abundant in most areas of suitable habitat within the seven-county area (Dames and Moore 1975; Brown 1971, 1974; Murray-McCormick Environ. Group 1974; Miss. Chem. Corp. 1976). Populations tend to be more continuous in sandhill areas of Hillsborough and Polk counties but more isolated farther south in the seven-county area.

Basis for Priority Status: This species is listed as biologically significant because the southern limit of its range is in the seven-county area. Its ecological distribution is a good indicator of better-drained soil types.

Potential Impacts of Mining: Losses of pine-turkey oak and drier pine flatwoods and grassland habitats due to mining will undoubtedly reduce populations of this species in the seven-county area. Reclamation to grassland and oldfields might restore habitat, although changes in soil composition of reclaimed lands may be unsuitable to the pocket gopher.

Selected References:

*Brown, L. N. 1971. Breeding biology of the pocket gopher (*Geomys pinetis*) in southern Florida. Amer. Midl. Nat. 85: 45-53.

*Brown, L. N. 1974. Mammalian faunal assessment, Pages 67-80 *in* Cowell, B. C., *et al.*, Biological assessment of the Lower Hillsborough Flood Detention Area for recommendation of ecologically based land management. Univ. of So. Fla., Tampa. 111 pp.

*Dames and Moore. 1975. Hydrobiologic assessment of the Alafia and Little Manatee rivers. Report prep. for the Southwest Florida Water Management District by Dames and Moore, Consulting Engineers, Atlanta, Georgia.

*Hall, E. R., and K. R. Kelson. 1959. The mammals of North America. 2 vols. Ronald Press, New York. 1083 pp.

*Hubbell, T. H., and C. Goff. 1939. Florida pocket gopher burrows and their arthropod inhabitants. Proc. Fla. Acad. Sci. 4: 127-166.

*Mississippi Chemical Corporation. 1976. Ona, Hardee County. Development of regional impact application.

*Murray-McCormick Environmental Group of Florida. 1974. Bloomingdale development of regional impact application. Prep. for Lamonte-Shimberg Corp., Tampa, Florida.

*Rand, A. L., and P. Host. 1942. Mammal notes from Highland (sic) County, Florida. Results Archbold Exped. No. 45. Bull. Amer. Mus. Nat. Hist. 80, Art. 1. 21 pp.

*Woodruff, R. E. 1973. The scarab beetles of Florida. Arthropods of Florida and neighboring land areas, Vol. 8. Fla. Dept. Agric. and Consumer Serv., Div. Plant Ind. 220 pp.

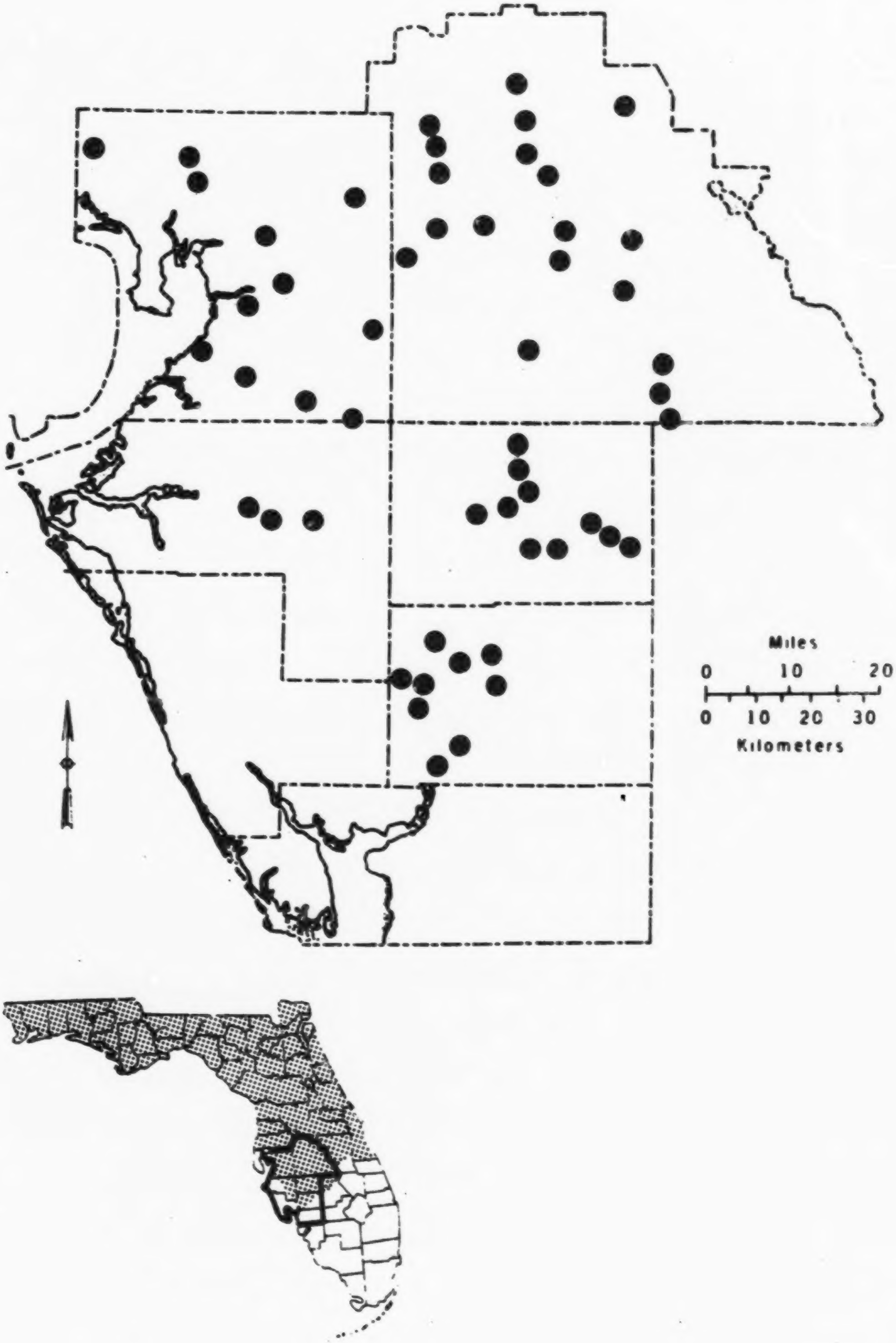
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Fig. VIII.E.13. SOUTHEASTERN POCKET GOPHER (Geomys pinetis)

Biologically Significant

EASTERN HARVEST MOUSE — Reithrodontomys humulis Audubon and Bachman

Order Rodentia — Family Muridae

Distribution: The limited records of the Harvest Mouse from the seven-county area include all counties except Charlotte and Hardee. It is distributed throughout the southeastern United States, extending west into Texas and northward to Pennsylvania (Hall and Kelson 1959). Although the range map in Hall and Kelson (1959) shows the species occurring to the southern tip of Florida, Layne (1974a) noted only one south Florida record: Ritta, along the south shore of Lake Okeechobee. The Harvest Mouse may thus reach the southern limit of its range in the seven-county area.

Habitat: The Eastern Harvest Mouse is typically associated with relatively dense grassy habitats. Within the seven-county area, this rodent has been recorded mostly from oldfields but also from dry prairies, freshwater marshes, and wet prairies.

Population Status: The Harvest Mouse is apparently generally rare in the study area, although it may occasionally be common locally. Brown (1974) classified it as uncommon in the Lower Hillsborough Flood Detention Area, Hillsborough County. However, it is rated as common in Myakka River State Park (Fla. Dept. Nat. Res. 1976) in Manatee and Sarasota counties. K. C. Alvarez (pers. comm.) reported that nine specimens, an unusually high number for this species, were trapped in marshes and wet meadows at this locality by D. Sessiums. J. B. Funderburg (pers. comm.) also found Harvest Mice abundant in grassland areas of the Orange Park phosphate mine, Polk County, in 1962-1966. In a flatwoods habitat in north-central Florida, Layne (1974b) recorded a maximum population density of about 0.4 individuals per acre.

Basis for Priority Status: The Eastern Harvest Mouse reaches its southern range limit in the seven-county area, and this is of biogeographic interest.

Potential Impacts of Mining: Overall, mining would probably have little effect on this already scarce species. Unreclaimed mined land grown up to grasses and areas reclaimed to grasslands would presumably provide suitable habitat, based on Funderburg's observations.

Selected References:

*Brown, L. N. 1974. Mammalian faunal assessment, Pages 67-80 *in* Cowell, B. C., *et al*., Biological assessment of the Lower Hillsborough Flood Detention Area for recommendation of ecologically based land management. Univ. of So. Fla., Tampa. 111 pp.

*Florida Department of Natural Resources. 1976. Vertebrates of Myakka River State Park. 26 pp.

*Hall, E. R., and K. R. Kelson. 1959. The mammals of North America. 2 vols. Ronald Press, New York. 1083 pp.

*Layne, J. N. 1974a. The land mammals of south Florida, Pages 386-413 *in* Gleason, P. J., ed., Environments of south Florida: present and past. Miami Geol. Soc. Memoir 2. 452 pp.

*Layne, J. N. 1974b. Ecology of small mammals in a flatwoods habitat in north-central Florida, with emphasis on the cotton rat (*Sigmodon hispidus*). Amer. Mus. Novitates No. 2544. 48 pp.

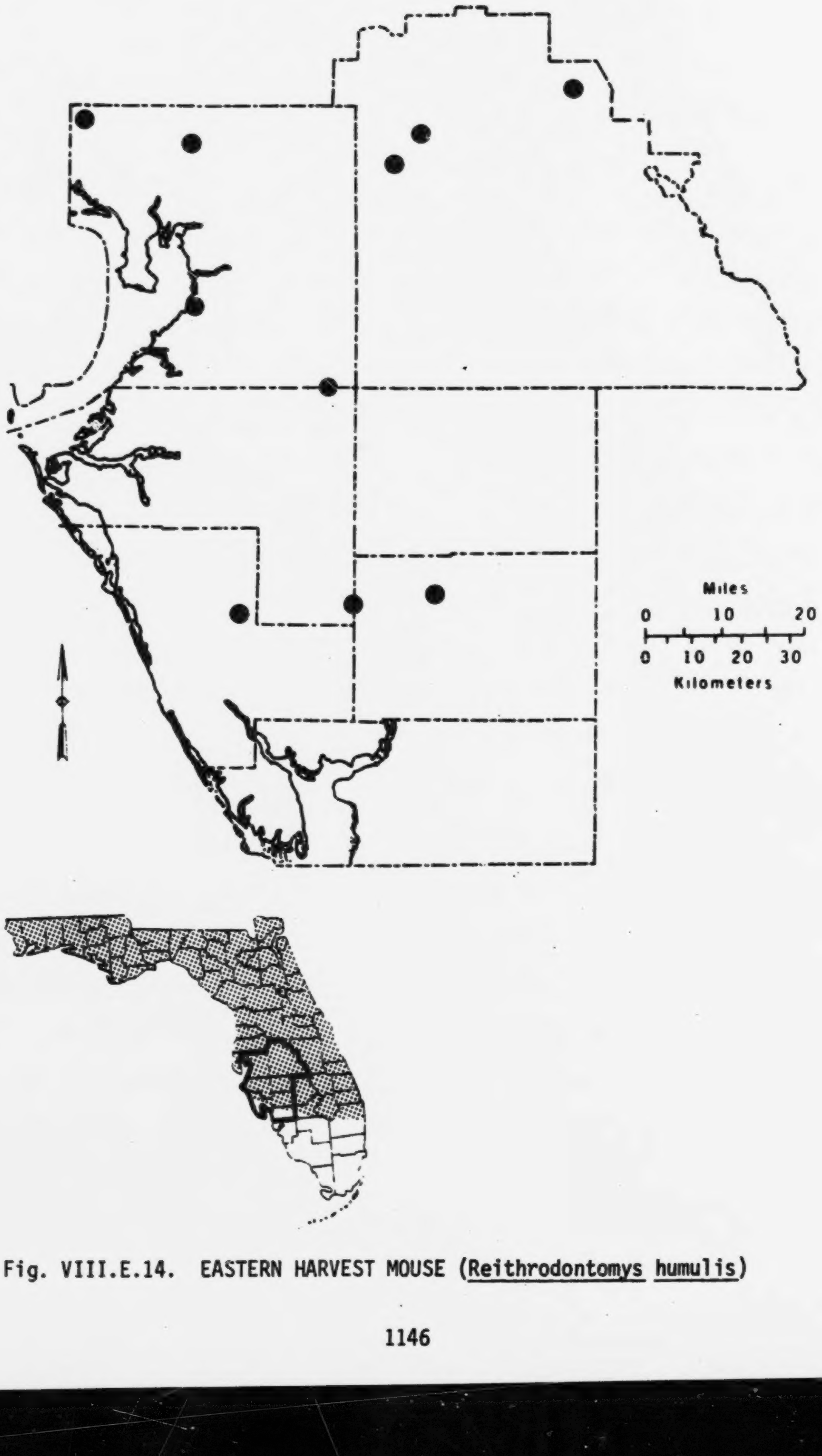
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Fig. VIII.E.14. EASTERN HARVEST MOUSE (Reithrodontomys humulis)

Biologically Significant

CHADWICK COTTON MOUSE | Peromyscus gossypinus restrictus Howell

Order Rodentia | Family Muridae

Distribution: This race of the Cotton Mouse is known only from Chadwick Beach (Sarasota County), the type locality, although Hall and Kelson (1959) map the range as including the coastal area of Charlotte, Sarasota, and Manatee counties. The other subspecies occurring in the seven-county area is Peromyscus gossypinus palmarius. It is probably the most abundant and widespread small mammal in the study area.

Habitat: The 15 specimens from which this subspecies was described were collected by L. C. Goldman and A. H. Howell in 1938 "among the sea oats on the Gulf beach, and also in the adjacent cabbage palm jungle" (Howell 1939). Apparently no additional specimens have been recorded.

Population Status: Nothing is known about the current population status of this race.

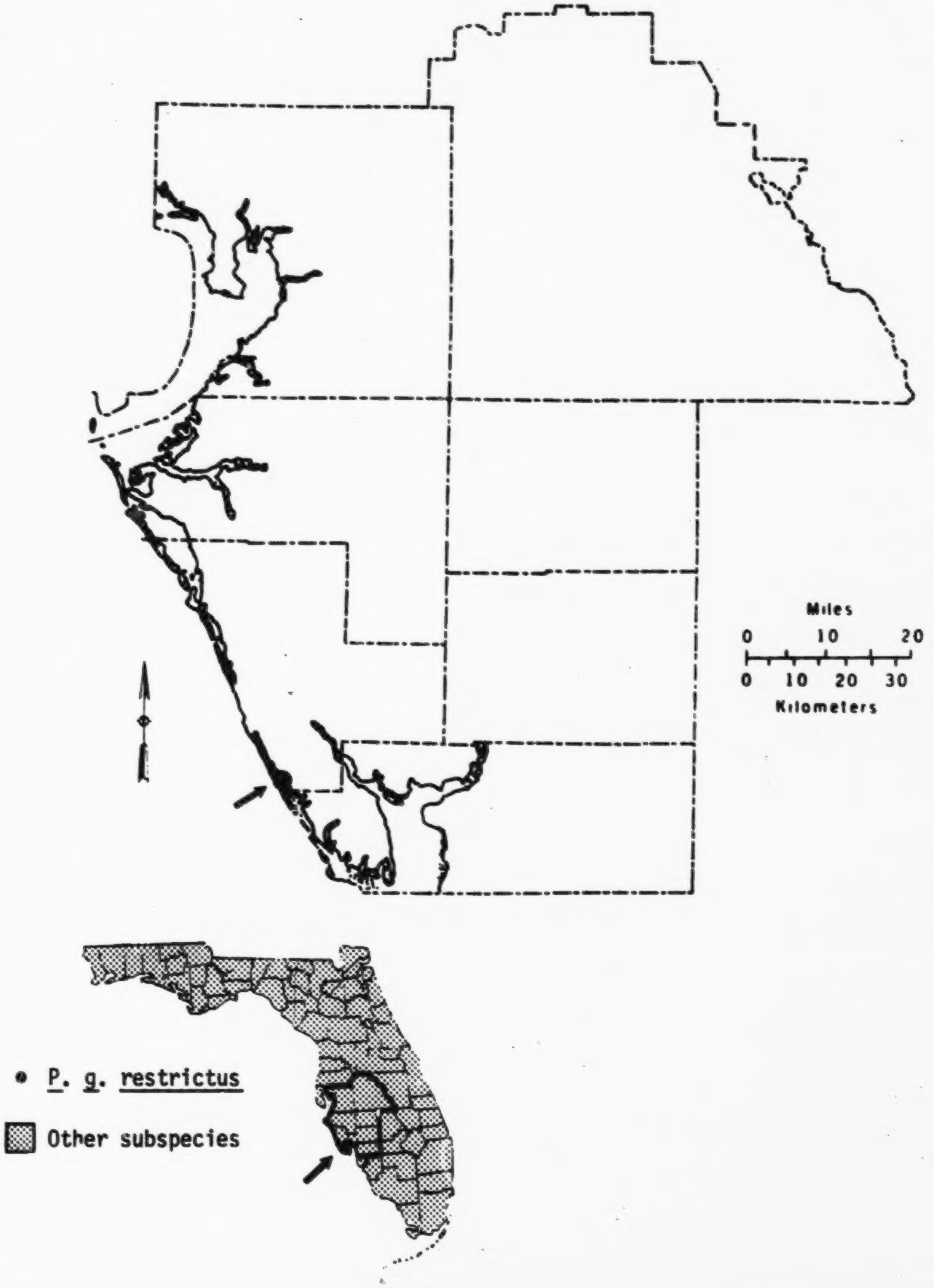
Basis for Priority Status: The Chadwick Cotton Mouse is considered of particular biological significance because of its apparently extremely localized range. In view of the continuing decrease of natural coastal habitats, there is an urgent need for a study to determine the current status of this form.

Potential Impacts of Mining: Phosphate mining would presumably have no effect on this mouse.

Selected References:

*Hall, E. R., and K. R. Kelson. 1959. The mammals of North America. 2 vols. Ronald Press, New York. 1083 pp.

*Howell, A. H. 1939. Descriptions of five new mammals from Florida. J. Mammal. 20: 363-365.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● P. g. restrictus
▨ Other subspecies

Fig. VIII.E.15. CHADWICK COTTON MOUSE (*Peromyscus gossypinus restrictus*)

Listed - Threatened

FLORIDA MOUSE | *Peromyscus floridanus* (Chapman)

Order Rodentia | Family Muridae

Distribution: Within the seven-county area, the Florida Mouse is definitely known from Hillsborough, Polk, and Sarasota counties and possibly from Manatee County. The species was reported from the W. R. Grace and Company Four Corners Mine site in southeastern Hillsborough County and northeastern Manatee County, but the information available does not indicate in which county the specimens were taken (Conservation Consultants, Inc. 1975). Within the seven-county area the range is relatively continuous in Hillsborough and Polk counties where the typical habitats are more prevalent, but the Sarasota County population is apparently isolated. This mouse is endemic to Florida and ranges from St. Johns, Clay, Alachua, Gilchrist, and Taylor counties southward to Sarasota County on the west, Highlands County in the center of the state, and, at least formerly, Dade County along the east coast (Layne 1976). Isolated populations have been reported along the Gulf coast in Franklin and Taylor counties (Douglass and Layne 1975).

Habitat: The Florida Mouse has an extremely narrow habitat range, being restricted to certain xeric scrub and woodlands. Its primary habitat is sand pine scrub in an early successional stage, but it also occurs regularly in longleaf pine-turkey oak, south Florida slash pine-turkey oak, and scrubby flatwoods associations (Layne 1976). Common characteristics of Florida Mouse habitats are relatively xeric conditions, an open tree stand, clumps of scrubby oaks and other shrubs with interspersed areas of open sand, and well-drained, sandy soils (Layne 1976). In the seven-county area, most records are from sand pine or oak scrub. Other reported habitats include pine flatwoods (Conservation Consultants, Inc. 1975) and a cypress stand (Dames and Moore 1975), which is a very atypical environment for this species.

Population Status: This species is locally distributed and generally rare in the seven-county area, although it may occur in some numbers in suitable habitat. It was listed as uncommon on the Lamonte-Shimberg Bloomingdale tract near Brandon (Murray-McCormick Environ. Group 1974). J. B. Funderburg (pers. comm.) found it rare in the Orange Park phosphate mine area in 1962-66. It comprised only 0.7 percent of small mammal captures in a study in the Alafia and Little Manatee river basins (Dames and Moore 1975). On the W. R. Grace property in Hillsborough and Manatee counties, relative abundance of this species was 20 per 100 trapnights (Conservation Consultants, Inc. 1975), a rather high figure. Populations of this species are decreasing throughout the range because of habitat destruction (Layne 1976).

Basis for Priority Status: The Florida Mouse is listed as Threatened by the Florida Game and Fresh Water Fish Commission and the Florida Committee on Rare and Endangered Plants and Animals, principally because of the wide-spread destruction of much of its habitat. Sand pine scrub and longleaf and Florida slash pine-turkey oak associations are favored for development because of their well-drained soils. Thousands of acres of former habitat also have been replaced by citrus groves and pine plantations (Layne 1976).

Potential Impacts of Mining: Destruction of xeric scrub and woodland associations by mining would threaten existing Florida Mouse populations in the northern part of the seven-county area. Although the species is not known from most of the Manatee, Sarasota, DeSoto, and Charlotte county area, isolated "islands" of suitable habitats do occur in this region, and more detailed search may eventually reveal Florida Mice in some of these areas. Destruction of isolated scrubs, sandhills, and scrubby flatwoods patches in this region thus might eliminate as yet unknown Florida Mouse populations, which, because of their isolation, would be of considerable biological interest.

Selected References:

*Conservation Consultants, Inc. 1975. A survey of vegetation and animal life,W. R. Grace and Company Four Corners Mine,southeastern Hillsborough County and northeastern Manatee County, Florida. Prep. for W. R. Grace and Co. development of regional impact application.

*Dames and Moore. 1975. Hydrobiologic assessment of the Alafia and Little Manatee rivers. Report prep. for the Southwest Fla. Water Management District by Dames and Moore, Consulting Engineers, Atlanta, Georgia.

*Douglass, J. F., and J. N. Layne. 1975. *Peromyscus floridanus* (Chapman 1889). MS prep. for Fla. Game and Fresh Water Fish Comm. in connection with Cross-Florida Barge Canal restudy. 32 pp.

*Layne, J. N. 1976. Florida Mouse, Pages 1047-1052 *in* Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

*Murray-McCormick Environmental Group of Florida. 1974. Bloomingdale development of regional impact application. Prep. for Lamonte-Shimberg Corp., Tampa, Florida.

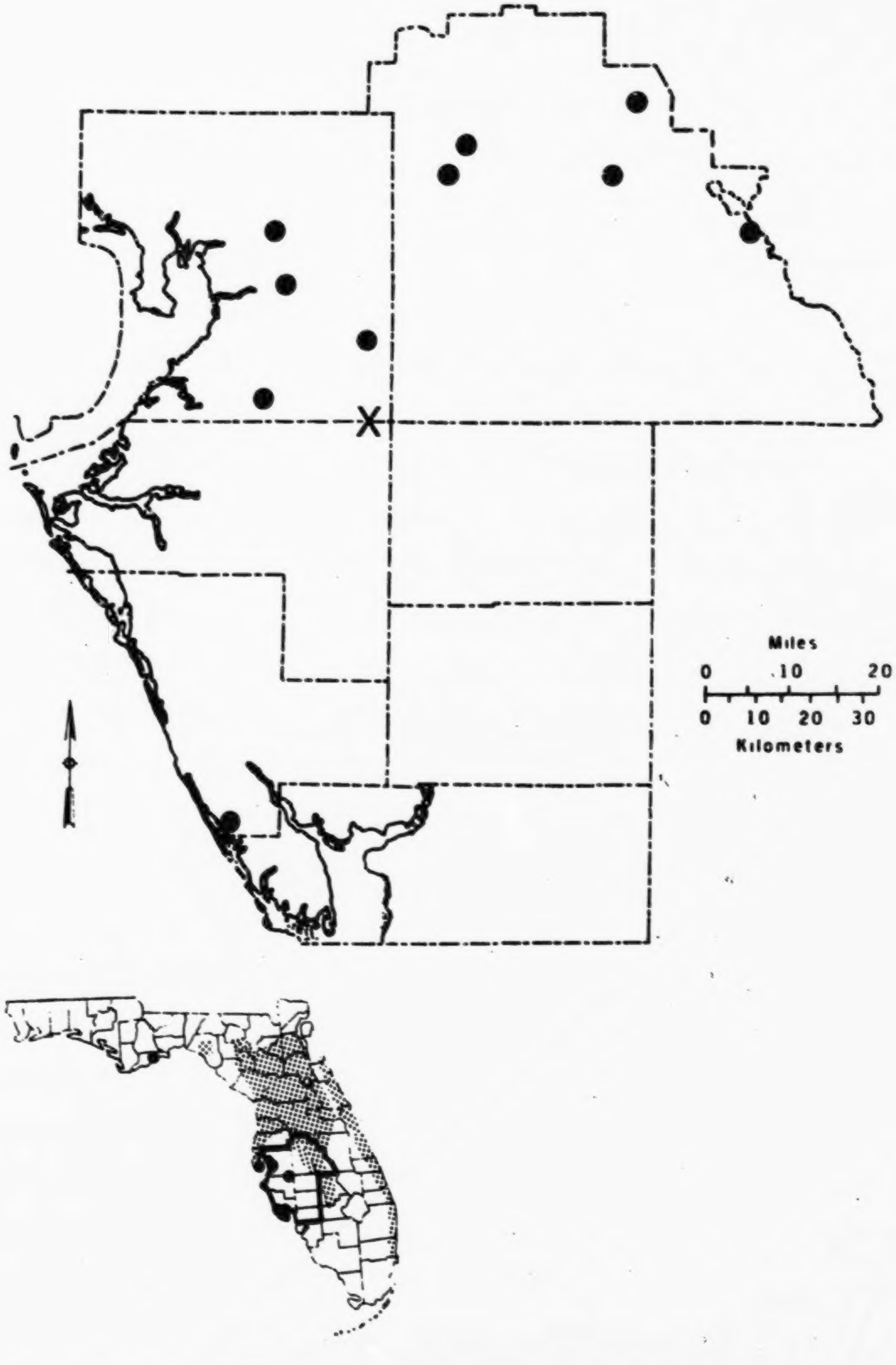
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Fig. VIII.E.16. FLORIDA MOUSE (*Peromyscus floridanus*)

Biologically Significant

GOLDEN MOUSE

Ochrotomys nuttalli (Harlan)

Order Rodentia

Family Muridae

Distribution: Records of the Golden Mouse in the seven-county area exist for Hillsborough, Polk, Manatee and DeSoto counties. It may be more widespread than present records suggest. The species' range extends throughout southeastern United States and includes all of northern Florida, south to about Charlotte, Hendry, and Palm Beach counties (approximately 27° latitude) (Packard 1969).

Habitat: The Golden Mouse is typically a forest dweller, with habitats ranging from floodplain, primarily hardwood, forests with brushy understory to drier, upland pine-oak woodlands and pine forests (Packard 1969). The species is highly arboreal and builds above-ground nests in tangled vines or clumps of Spanish moss. Within the seven-county area, Golden Mice have been reported in floodplain forest (Brown 1974), live oak-cabbage palm hammock (C. E. Winegarner pers. comm.), dense swamp (Hill 1945), and hydric hardwoods dominated by bald cypress, sweet bay, red maple and pop ash (Phillips Petroleum Co. 1975).

Population Status: This species is generally uncommon in the seven-county area, but may be locally common in suitable habitat. Stevenson (1967) found it to be rare in Hillsborough River State Park, while Brown (1974) found it common in the Lower Hillsborough Flood Detention Area, citing estimated densities ranging from 4 to 8 per acre depending on the season. The species was also rated as common on the Lamonte-Shimberg Bloomingdale tract in Hillsborough County (Murray-McCormick Environ. Group 1974).

Basis for Priority Status: This species is considered biologically significant both because of its relative habitat specificity and because it approaches its southern range limit in the seven-county area.

Potential Impacts of Mining: Extensive destruction of forested wetlands, live-oak cabbage palm hammocks, and other habitat types of this species would adversely affect its status in the seven-county area. The types of environments presently created by reclamation would not be suitable for the Golden Mouse.

Selected References:

*Brown, L. N. 1974. Mammalian faunal assessment, Pages 67-80 in Cowell, B. C., et al., Biological assessment of the Lower Hillsborough Flood Detention Area for recommendation of ecologically based land management. Univ. of So. Fla., Tampa. 111 pp.

*Hill, J. E. 1945. Bachman's Shrew from Polk County, Florida. J. Mammal. 26: 88.

*Murray-McCormick Environmental Group of Florida. 1974. Bloomingdale development of regional impact application. Prep. for Lamonte-Shimberg Corp., Tampa, Florida.

*Packard, R. L. 1969. Taxonomic review of the Golden Mouse, *Ochrotomys nuttalli*. Contr. Mammal., Mus. Nat. Hist., Univ. Kans. 428 pp.

*Phillips Petroleum Company. 1975. DeSoto and Manatee counties. Development of regional impact application.

*Stevenson, J. A. 1967. A list of the vertebrates identified in Hillsborough River State Park. Fla. Brd. of Parks. 16 pp.

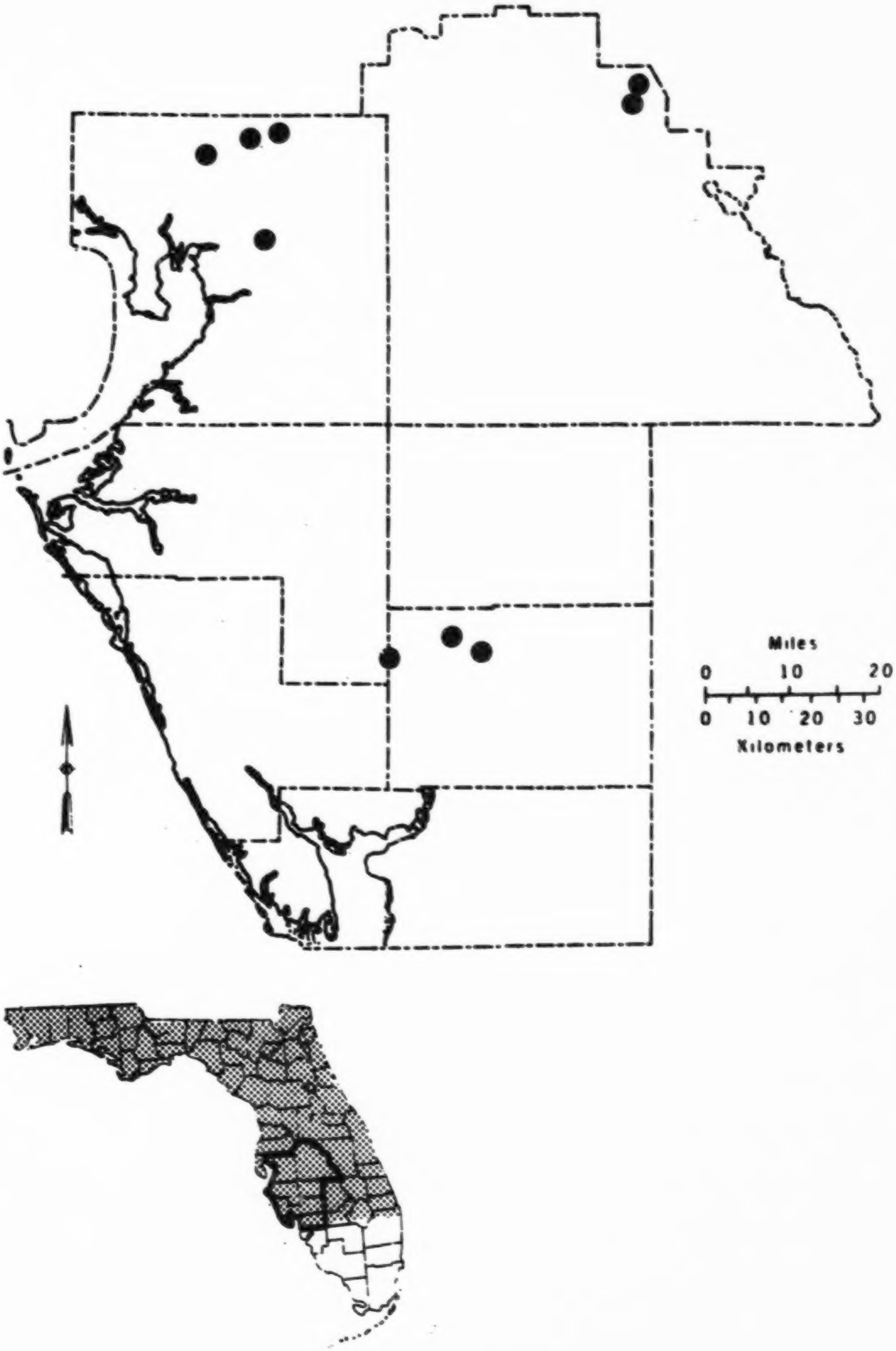
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Fig. VIII.E.17. GOLDEN MOUSE (Ochrotomys nuttalli)

Listed - Status Undetermined

INSULAR COTTON RAT Sigmodon hispidus insulicola Howell

Order Rodentia Family Muridae

Distribution: The only record for the Insular Cotton Rat within the seven-county area is from "Chadwick Beach" near Englewood (Sarasota County ?) (Howell 1943). The race is also known from Captiva Island which is the type locality, Sanibel Island, Pine Island, and probably Little Pine Island in Lee County (Layne 1976).

Habitat: The only habitat information for this subspecies is provided by Hamilton (1955) and Layne (1976). It occurred in garbage dumps in damp areas and pine-palmetto stands, and in dense areas of cord grass (Spartina patens) on Pine and Little Pine islands. On Sanibel Island, it has been recorded in drier areas of fresh water swamp and dry, open grassy fields and mixed grass-brushland. On Captiva Island it has been found in grassy areas.

Another subspecies of the cotton rat (Sigmodon hispidus floridanus) is abundant and widespread in the seven-county area. The cotton rat and Cotton Mouse (Peromyscus gossypinus) are the commonest small mammals in the study area, as well as the state as a whole.

Population Status: The status of the Insular Cotton Rat in the seven-county area is unknown. There have apparently been no attempts to collect the subspecies at the Englewood locality since the original specimens were obtained over 30 years ago. Numbers on Sanibel Island appear to undergo year-to-year fluctuations (Layne 1976).

Basis for Priority Status: The race is listed as Status Undetermined by the

Florida Committee on Rare and Endangered Plants and Animals due principally to its very limited distribution and the continuing destruction of its habitats by development.

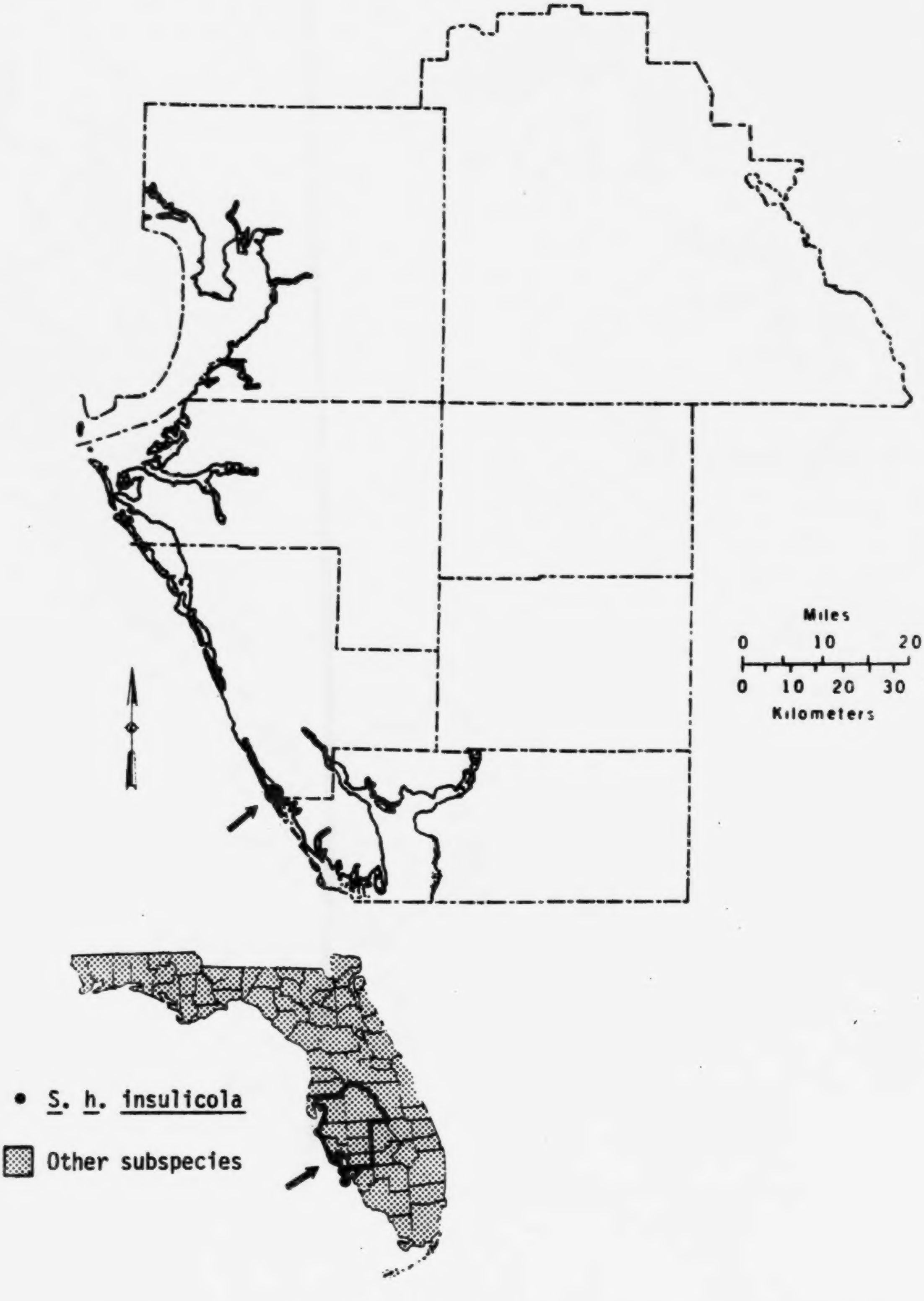
Potential Impacts of Mining: Phosphate mining should have no effect on this race of the cotton rat, as the range is well removed from potential areas of mining or activities associated with phosphate processing and shipping.

Selected References:

*Hamilton, W. J., Jr. 1955. Two new rice rats (Genus *Oryzomys*) from Florida. Proc. Biol. Soc. Wash. 68: 83-86.

*Howell, A. H. 1943. Two new cotton rats from Florida. Proc. Biol. Soc. Wash. 56: 73-76.

*Layne, J. N. 1976. Insular Cotton Rat, Pages 1135-1136 *in* Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.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● S. h. insulicola
▨ Other subspecies

Fig. VIII.E.18. INSULAR COTTON RAT (*Sigmodon hispidus insulicola*)

Commercial

BLUE CRAB — *Callinectes sapidus* Rathbun

Order Decapoda — Family Portunidae

Distribution: The Blue Crab is common along the entire west coast of Florida, and occurs along both the Gulf and east coasts of the United States in shallow water.

Habitat: This species uses different salinity regimes at different times of its life. Females spawn near or in the Gulf and the planktonic larvae settle to the bottom. Post-larval stages move upstream with the saline deep water into the estuaries. Mating occurs in low and medium salinity water, and females return to the Gulf to spawn.

Dragovich and Kelly (1964) report this species to be found throughout Tampa Bay. It is very common in the brackish waters of Old Tampa Bay, but is rarely collected at the mouth of Tampa Bay and adjacent offshore waters.

Utilization: The Division of Marine Resources (1975) reports the following landings in the seven-county area. The total dollar value for the region was $118,488 for 1975. Presumably the bulk of the crabs reported from the four coastal counties were harvested in the general area.

	Charlotte		Hillsborough		Manatee		Sarasota	
	pounds	dollars	pounds	dollars	pounds	dollars	pounds	dollars
Hard	254,045	31,771	440,205	39,912	171,763	26,620	156,296	19,719
Soft	60	79	340	387	-	-	-	-
Total	254,105	31,850	440,545	40,299	171,763	26,620	156,296	19,719

Potential Impacts of Mining: Blue Crabs are potentially more vulnerable to adverse affects of phosphate mining than other marine invertebrates, as they

Basis for Priority Status: The woodrat's preference for wet, forested habitats makes it a good indicator of environmental conditions of such associations. The population in the seven-county area is also of zoogeographic significance, as it marks the southern limits of the range on the Florida mainland.

Potential Impacts of Mining: Mining of wetland forests and dense hammock would be detrimental to the status of the Eastern Woodrat in the seven-county area. Current reclamation practices do not replace habitats that would be utilized by this species. Even if attempts were made to re-establish swampy forests on reclaimed land, it would take a long time before they reached a stage suitable for the woodrat.

Selected References:

*Brown, L. N. 1974. Mammalian faunal assessment, Pages 67-80 in Cowell, B. C., et al., Biological assessment of the Lower Hillsborough Flood Detention Area for recommendation of ecologically based land management. Univ. of So. Fla., Tampa. 111 pp.

*Hall, E. R., and K. R. Kelson. 1959. The mammals of North America. 2 vols. Ronald Press, New York. 1083 pp.

*Hamilton, W. J., Jr. 1943. The mammals of eastern United States; an account of Recent land mammals occurring east of the Mississippi. Comstock Press, Ithaca, New York. 432 pp.

*Layne, J. N. 1974. The land mammals of south Florida, Pages 386-413 in Gleason, P. J., ed., Environments of south Florida: present and past. Miami Geol. Soc. Memoir 2. 452 pp.

*Long, R. W. 1975. A biological assessment of Beacon Key, Florida. Tampa Elec. Co. Unpubl. MS. 264 pp.

*Stevenson, H. M. 1976. Vertebrates of Florida, identification and distribution. Univ. Presses of Fla., Gainesville. 607 pp.

*Stevenson, J. A. 1967. A list of the vertebrates identified in Hillsborough River State Park. Fla. Brd. of Parks. 16 pp.

*Worth, C. B. 1950. Observations on the behavior and breeding of captive rice rats and woodrats. J. Mammal. 31: 421-426.

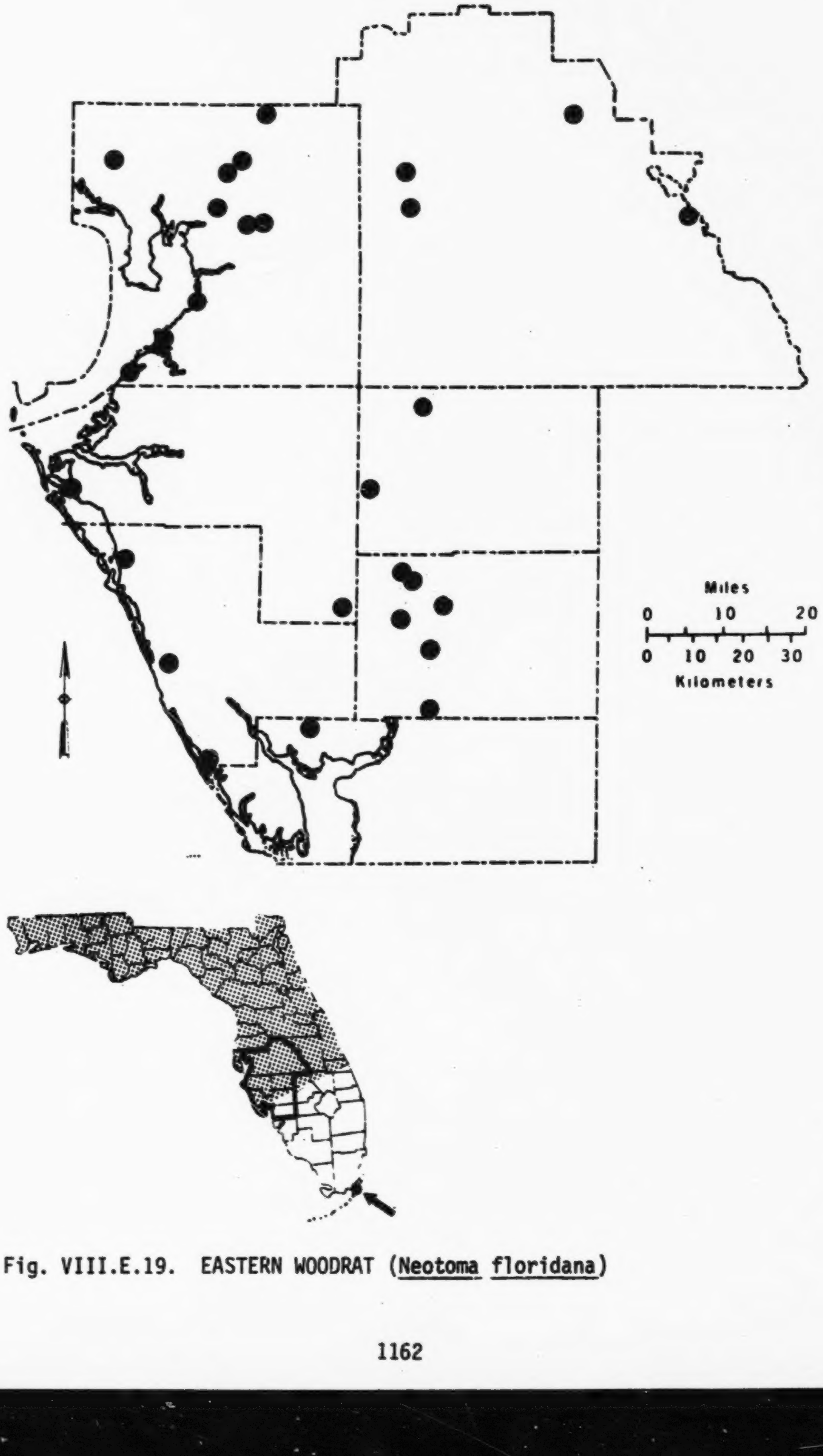
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Fig. VIII.E.19. EASTERN WOODRAT (Neotoma floridana)

Listed - Species of Special Concern

ROUND-TAILED MUSKRAT — *Neofiber alleni* True

Order Rodentia — Family Muridae

Other Names: Florida Water Rat, Muck Rat

Distribution: Records for the Round-tailed Muskrat exist for all counties in the study area except Charlotte and Hardee. This monotypic rodent species is limited in distribution to Florida and the Okefenokee Swamp of southeastern Georgia. It is rare to non-existent in the panhandle west of the Apalachicola River and along the upper west Gulf coast from Taylor and Suwannee counties south to Hillsborough County (Birkenholz 1963, Tilmant 1976).

Habitat: The Round-tailed Muskrat prefers marshes and shallow water areas with moderate to dense stands of emergent vegetation, principally maiden cane (*Panicum hemotomon*) and pickerel weed (*Pontederia lanceolata*). Water levels not exceeding 500 mm with soft substrate often support large populations (Porter 1953, Birkenholz 1963). Although typically a freshwater inhabitant, this species has been regularly recorded from salt marshes along the Florida coast (Hamilton 1943). Areas dominated by expanses of saw grass (*Cladium*) are apparently poor habitats (Layne 1974). Within the seven-county area, freshwater marshes and vegetated lake and pond shorelines are the principal habitat types reported for the Round-tailed Muskrat.

Population Status: This species is sometimes locally common in suitable habitats (Tilmant 1976). The population in any one area may fluctuate greatly in a short time, principally from variation in water levels (Porter 1953). Within the study area, it is generally uncommon and spotty in occurrence. Brown (1974) lists this species as uncommon in marshes in the

Lower Hillsborough Flood Detention Area, and Stevenson (1967) regarded it as rare in Hillsborough River State Park. Paul (1967) indicated that the population of an isolated marsh he studied in Hillsborough County was relatively small. Tilmant (1976) does not include any portion of the seven-county area as a region where this rodent is common.

Basis for Priority Status: The Round-tailed Muskrat is listed as a Species of Special Concern by the Florida Committee on Rare and Endangered Plants and Animals. It has fairly rigid habitat restrictions, and excessive marsh drainage, land filling, and salt water intrusion have reduced areas of suitable habitat and isolated some colonies (Tilmant 1976).

Potential Impacts of Mining: Because of the Round-tailed Muskrat's dependence on shallow ponds, marshes, and wet prairie habitats, destruction of such areas by mining would reduce the population of this species in the seven-county area. As no records of this species apparently exist for slime settling ponds, old flooded mine cuts, or aquatic habitats in reclaimed areas, it appears that such habitats are not suitable for the species. However, it would be feasible to create wetland types on reclaimed lands that could support populations of Round-tailed Muskrats.

Selected References:

*Birkenholz, D. E. 1963. A study of the life history and ecology of the Round-tailed Muskrat (Neofiber alleni True) in north-central Florida. Ecol. Monogr. 33: 255-280.

Birkenholz, D. E. 1972. Neofiber alleni. Mammalian Species 15: 1-4.

*Brown, L. N. 1974. Mammalian faunal assessment, Pages 67-80 in B. C. Cowell, et al., Biological assessment of the Lower Hillsborough Flood

Detention Area for recommendation of ecologically based land management. Univ. of So. Fla., Tampa.

*Hamilton, W. J., Jr. 1943. The mammals of eastern United States; an account of Recent land mammals occurring east of the Mississippi. Comstock Press, Ithaca, New York. 432 pp.

*Layne, J. N. 1974. The land mammals of south Florida, Pages 386-413 *in* P. J. Gleason, ed., Environments of south Florida: present and past. Miami Geol. Soc. Memoir 2. 452 pp.

*Paul, J. R. 1967. Round-tailed Muskrat in west-central Florida. Quart. J. Fla. Acad. Sci. 30: 227-229.

*Porter, R. P. 1953. A contribution to the life history of the water rat, *Neofiber alleni*. M.S. Thesis. Univ. of Miami. 85 pp.

*Stevenson, J. A. 1967. A list of the vertebrates identified in Hillsborough River State Park. Fla. Brd. of Parks. 16 pp.

*Tilmant, J. T. 1976. Round-tailed Muskrat, Pages 1114-1119 *in* Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

Worley, D. J., and J. N. Layne. 1975. *Neofiber alleni* True, 1884. MS prep. for Fla. Game and Fresh Water Fish Comm. in connection with Cross-Florida Barge Canal restudy. 27 pp.

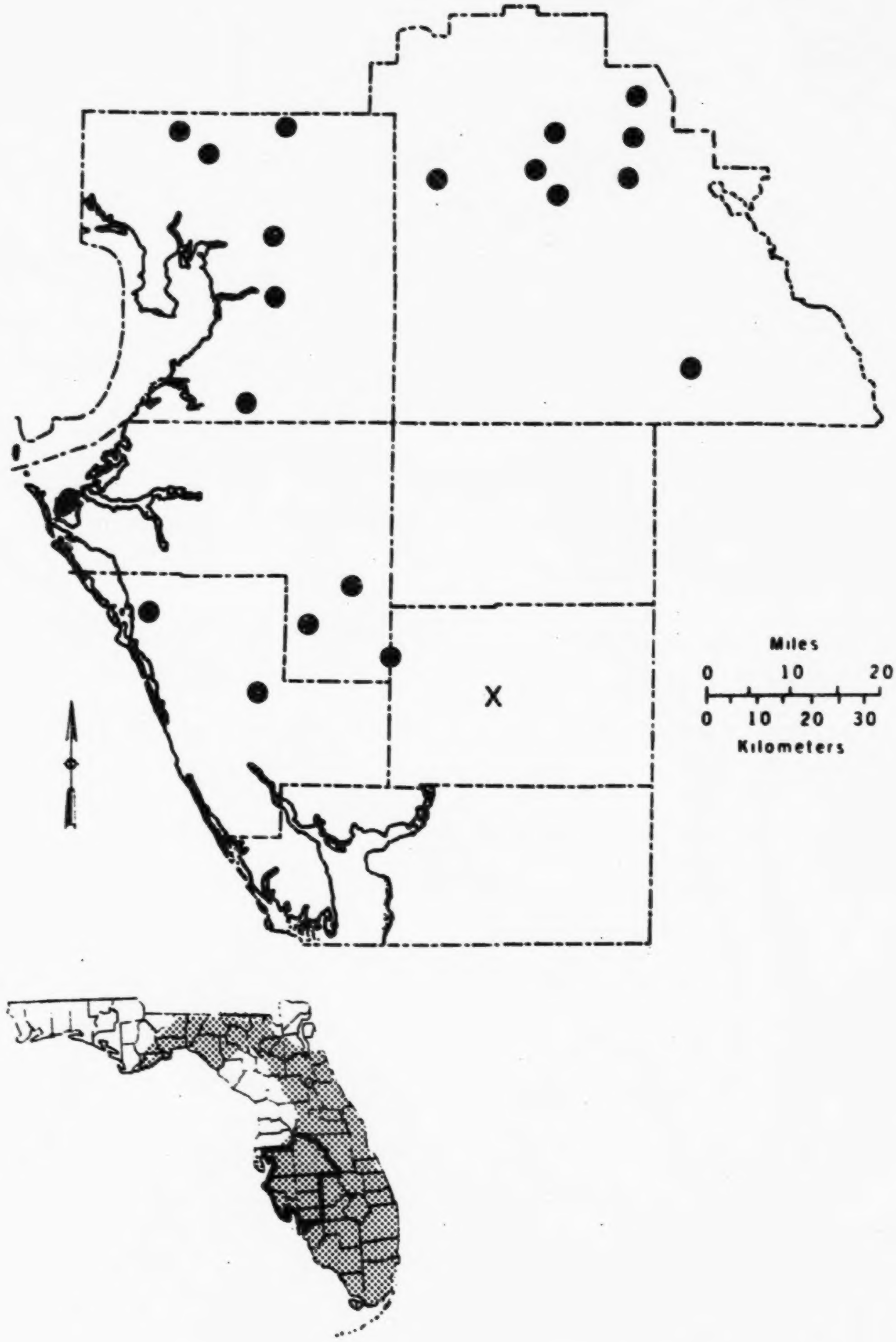
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Fig. VIII.E.20. ROUND-TAILED MUSKRAT (Neofiber alleni)

Biologically Significant

NUTRIA | *Myocastor coypus* Kerr

Order Rodentia | Family Capromyidae

Other Names: Coypu, Swamp Beaver

Distribution: Single individuals of this exotic species have been reported as collected in Hillsborough County (Hillsborough River and intersection of Busch Boulevard and Dale Mabry Avenue in Tampa) and Polk County (about 35 miles from Tampa on State Route 60). Questionable records exist for the Alafia and Little Manatee river basins. The report by Dames and Moore (1975) implies actual observations of Nutria at these localities, but the evidence is not clear. In addition, well-established populations occur in dairy ponds and lagoons in the vicinity of Brandon, Hillsborough County (Brown 1975). Feral Nutria or escapees may also have occurred in Hardee County based on the map in Manville (1962). Nutria farms are known to have existed at one time or another in Hillsborough, DeSoto, Manatee, and Sarasota counties (Griffo 1957).

The Nutria is well established in northern Gulf coast states and in many other parts of the United States (Lowery 1974). Feral populations have been reported from at least 31 states and 3 Canadian provinces (Manville 1962). This species occurs naturally in temperate South America.

Habitat: Nutria inhabit freshwater and coastal habitats including lakes, bayous, rivers, and marshes (Griffo 1957). Within the seven-county area, Brown (1975) has recorded them in ponds formed by run-off from dairy farms in the vicinity of Brandon, Hillsborough County. The Nutria fed on shore vegetation and hyacinths. He believes that they are "extremely adaptive to a wide variety of aquatic conditions." The animals often dig large burrows around these ponds.

Population Status: The Nutria is apparently generally rare in the seven-county area, although abundant in the Brandon region where Brown (1974, 1975) has reported high populations in ponds on dairy farms. Densities were higher in polluted than unpolluted ponds. In 1957, Nutria farms in the seven-county area had a total of 34 captive animals, including 18 in Arcadia, 10 in Tampa, 4 in Plant City, and 2 in Sarasota. It is doubtful if any captive populations still exist in the region.

Basis for Priority Status: The Nutria is considered as biologically significant because of its potential of spreading into various aquatic habitats of the seven-county area with potentially deleterious effects on native flora and fauna. This species has a high reproductive potential, a continuous breeding season, and the potential for being "as ubiquitous as the Black Rat" (Brown 1975). Potential competitors in aquatic situations appear to be few, opening the avenue for range expansion, which Brown (1974) believes may be occurring in the Tampa region.

Potential Impacts of Mining: Phosphate mining will probably have little effect on the Nutria. However, an increase in slime settling basins accompanying mining may encourage further establishment of this species in the seven-county area.

Selected References:

*Brown, L. N. 1974. Breeding biology of the Nutria (*Myocastor coypus*) in the Tampa Bay area, Florida. Abstr. Papers 54th Ann. Meeting Amer. Soc. Mammal.

*Brown, L. N. 1975. Ecological relationships and breeding biology of the Nutria (Myocastor coypus) in the Tampa, Florida, area. J. Mammal. 56: 928-930.

*Dames and Moore. 1975. Hydrobiologic assessment of the Alafia and Little Manatee rivers. Report prep. for the Southwest Fla. Water Management District by Dames and Moore, Consulting Engineers, Atlanta, Georgia.

*Griffo, J. V., Jr. 1957. The status of the Nutria in Florida. Quart. J. Fla. Acad. Sci. 20: 209-215.

*Lowery, G. H., Jr. 1974. The mammals of Louisiana and its adjacent waters. Louisiana St. Univ. Press, Baton Rouge. 565 pp.

*Manville, R. H. 1962. The Nutria in the United States. U. S. Dept. Int. Fish and Wildl. Serv., Wildl. Leafl. 445. 4 pp.

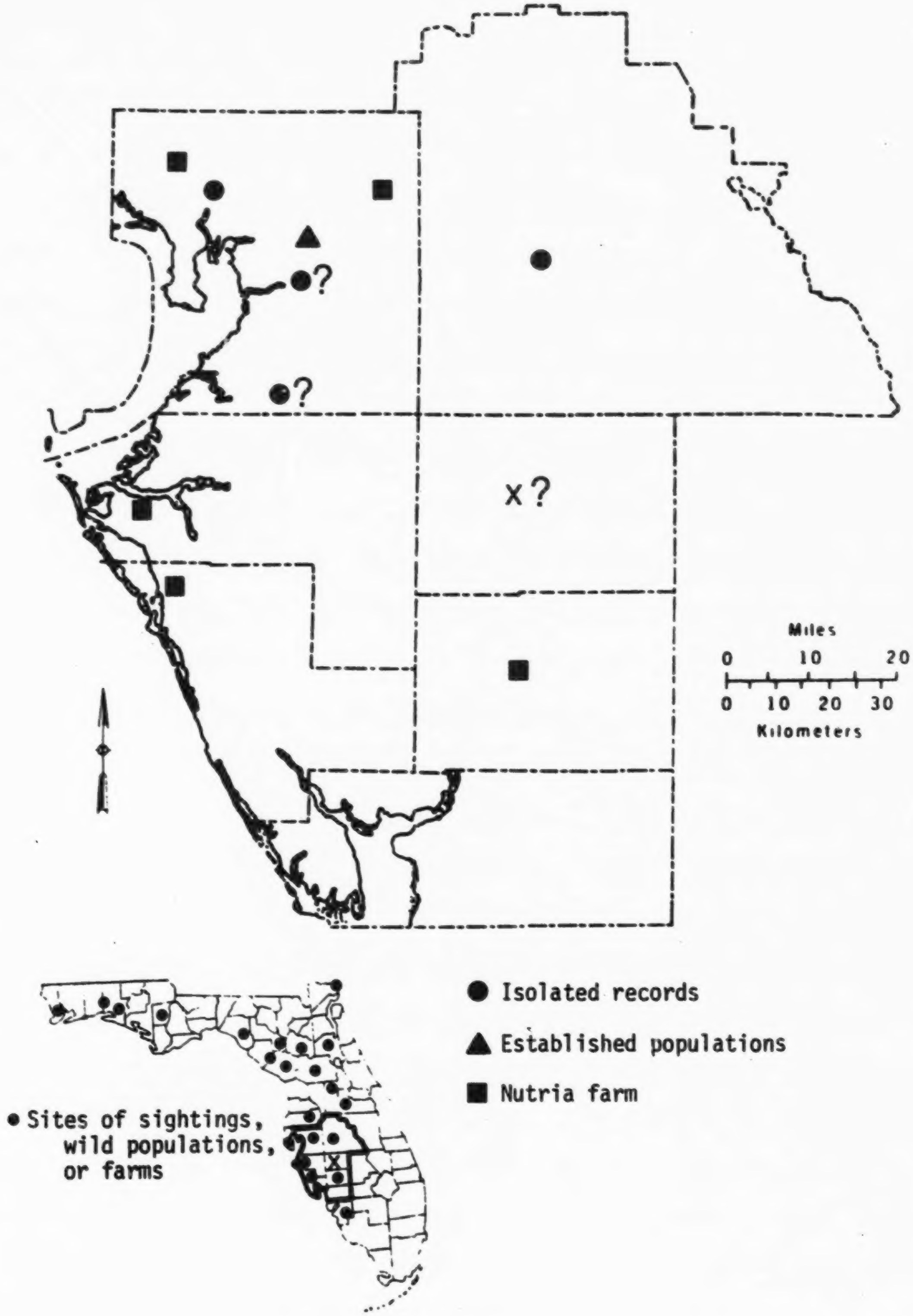
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Fig. VIII.E.21. NUTRIA (Myocastor coypus)

Biologically Significant

BOTTLE-NOSED DOLPHIN — *Tursiops truncatus* (Montague)

Order Cetacea — Family Delphinidae

Distribution: Records for the Bottle-nosed Dolphin exist for the four coastal counties: Hillsborough, Manatee, Sarasota, and Charlotte. It is actually more frequent along the coast of the seven-county area than suggested by the few plotted records. This species occurs in the coastal waters of the western Atlantic from Massachusetts to Florida, the Gulf of Mexico, the Lesser Antilles, and Venezuela, and along the eastern Atlantic coast from Norway and the Baltic Sea to the Congo (Lowery 1974).

Habitat: This is a species of shallow, and often low salinity, coastal waters (Gunter 1954). Major habitats include waters along open beaches extending seaward to a maximum of 50-100 miles, but usually much less, and the protected waters of inlets, bays, natural and artificial waterways, and flooded marshes. They occur in waters usually not much deeper than a few hundred feet at most (Caldwell and Caldwell 1972). Lowery (1974) found this species in greatest numbers in the vicinity of passes connecting bays with the Gulf, and in back bays. Estuarine and near-shore Gulf waters are inhabited around the Charlotte Harbor area (Taylor 1974). Inshore waters, in which most Bottle-nosed Dolphins live, are usually turbid (Caldwell and Caldwell 1972).

Population Status: The Bottle-nosed Dolphin is the most common species of dolphin of the inshore Atlantic waters of North America (Caldwell and Caldwell 1972). Layne (1965) considered this species to be abundant in Florida waters year-round. Although no quantitative data on populations are available, general observations indicate that this species is generally common along the coast of the seven-county area.

Basis for Priority Status: The tendency for this marine mammal to inhabit the shallow, coastal waters makes it biologically significant as an indicator of the quality of estuarine and other inshore marine habitats.

Potential Impacts of Mining: Actual mining will have no effect on this species, but adverse changes in estuarine and shallow coastal environments resulting from indirect effects of phosphate mining could be detrimental to it.

Selected References:

*Caldwell, D. K., and M. C. Caldwell. 1972. The world of the Bottle-nosed Dolphin. J. B. Lippincott Co., Philadelphia and New York. 158 pp.

*Gunter, G. 1954. Mammals of the Gulf of Mexico, Pages 543-551 in Gulf of Mexico, its origin, waters, and marine life. U.S. Dept. Int. Fish Bull. 89. 604 pp.

*Layne, J. N. 1965. Observations on marine mammals in Florida waters. Bull. Fla. State Mus. 9: 131-181.

*Lowery, G. H., Jr. 1974. The mammals of Louisiana and its adjacent waters. Louisiana State Univ. Press, Baton Rouge. 565 pp.

Moore, J. C. 1953. Distribution of marine mammals to Florida waters. Amer. Midl. Nat. 49: 117-158.

*Taylor, J. L. 1974. The Charlotte Harbor estuarine system. Fla. Sci. 37(4): 205-216.

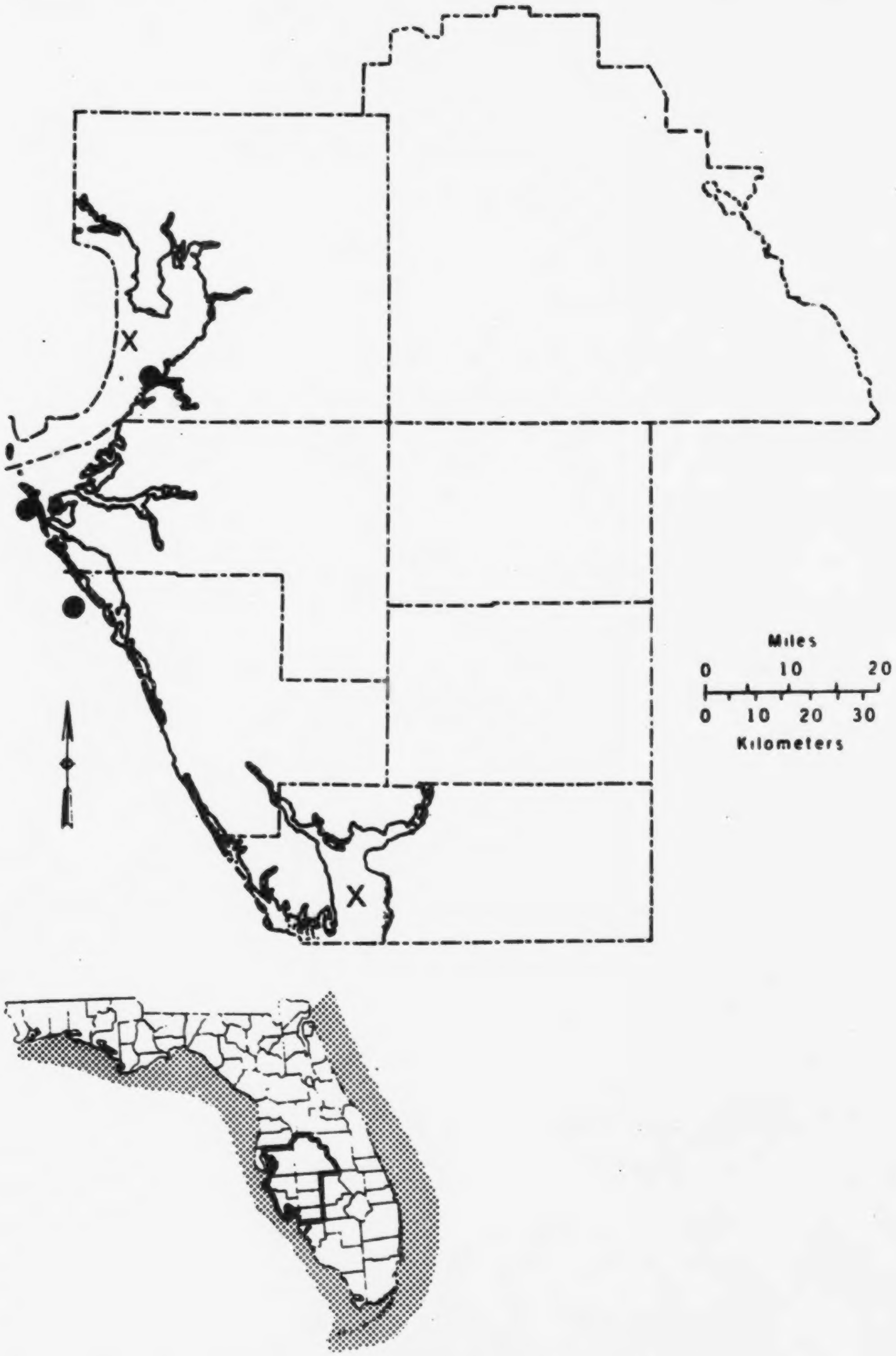
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Fig. VIII.E.22. BOTTLE-NOSED DOLPHIN (*Tursiops truncatus*)

Biologically Significant

COYOTE — *Canis latrans* Say

Order Carnivora — Family Canidae

Other Names: Brush Wolf

Distribution: Records of the Coyote exist for Polk County (Lake Wales region) and DeSoto County (near Arcadia). Five known specimens have been collected in the vicinity of Lake Wales, including an adult in 1957 (Florida State Museum Mammal Collection No. 4588) and two adults and two young in 1969 (Cunningham and Dunford 1970). Young and Jackson (1951) mention releases in Palm Beach County and Coyotes killed in Collier, Monroe, and Marion counties. The natural range extends from Alaska southward to southern Central America and from the Pacific coast eastward to Ontario, Indiana, Illinois and Louisiana (Hall and Kelson 1959).

Habitat: The Coyote is typically found in fairly open, brushy country or idle farm lands bordered by timber. Dens are in gulleys, under roots or overhanging banks, and in places with thickets and dense cover (Lowery 1974). The habitat in the Lake Wales region includes citrus groves, pastures, and scrubby areas on well-drained soils (J. N. Layne pers. comm.).

Population Status: All Florida records are directly or indirectly the result of introductions. According to Cunningham and Dunford (1970), 10 were released near Arcadia (DeSoto County) in 1925, and 16 more in 1930-31. Dunford (1969) noted that introductions were first made in the early 1950's in the Lake Wales area by local sportsmen. The only breeding records come from near Lake Wales (Polk County) on 28 May 1969, where two pups were dug out of a den. Coyotes were introduced in Florida for hunting. The only presently established population in the state appears to be in the Lake Wales region, where, according to reports of local ranchers, the animals are relatively common and are responsible for some livestock losses (J. N. Layne pers. comm.).

Basis for Priority Status: The Coyote is considered biologically significant because of its known establishment in the seven-county area and potential for range and population expansion which could have an impact on native wildlife.

Potential Impacts of Mining: The Coyote would not be directly affected by mining. Unreclaimed mined lands and areas reclaimed to grasslands would be potential habitat for this species.

Selected References:

*Cunningham, V. D., and R. D. Dunford. 1970. Recent Coyote record from Florida. Quart. J. Fla. Acad. Sci. 33: 279-280.

*Dunford, R. 1969. Even Coyotes like Florida. Fla. Wildl. 23(4): 4-5.

*Hall, E. R., and K. R. Kelson. 1959. The mammals of North America. 2 vols. Ronald Press, New York. 1083 pp.

*Lowery, G. H., Jr. 1974. The mammals of Louisiana and its adjacent waters. Louisiana State Univ. Press, Baton Rouge. 565 pp.

*Young, S. P., and H. H. T. Jackson. 1951. The clever Coyote. The Stackpole Co., Harrisburg, Pennsylvania. 411 pp.

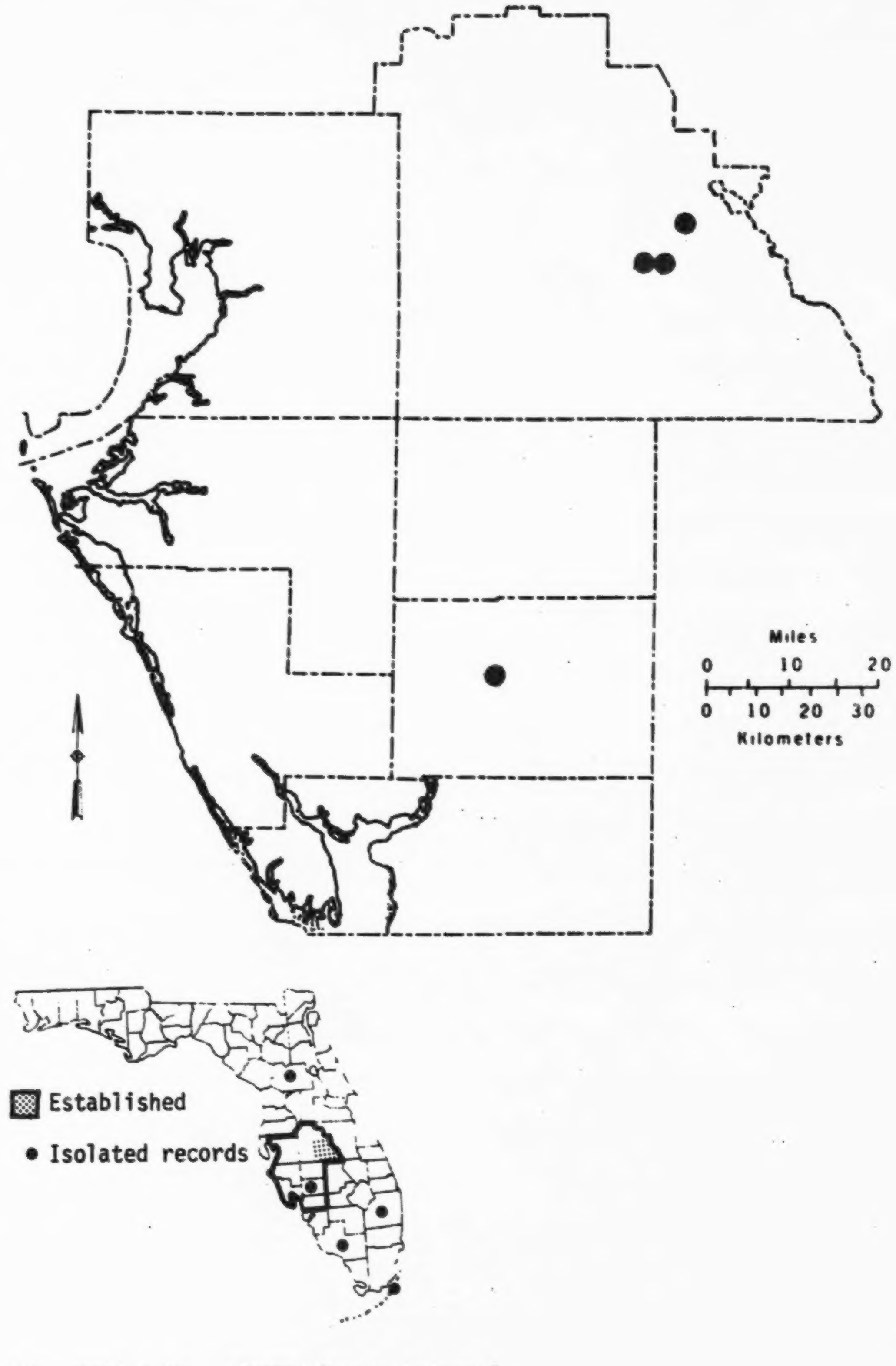
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Fig. VIII.E.23. COYOTE (Canis latrans)

Biologically Significant

RED FOX | *Vulpes vulpes* Linnaeus

Order Carnivora | Family Canidae

Distribution: The Red Fox has been recorded from all counties in the seven-county area except Charlotte. As a result of introductions, the Red Fox is now in many parts of the state (J. N. Layne pers. comm.). The species extends over most of North America from the Arctic Ocean to the southern United States. It is absent from the southeastern United States, much of the Great Plains, and portions of western United States (Hall and Kelson 1959).

Habitat: The Red Fox occupies many diverse habitats, with a preference for a combination of open land and sparsely wooded areas (Hamilton 1943). Where this fox occurs sympatrically with the Gray Fox it tends to occupy more open country, while the Gray Fox is principally a woodland species (Naggiar 1976). The Red Fox avoids swamps and hammocks, favorite haunts of the Gray Fox, and is most often in disturbed areas, whereas the Gray Fox prefers natural areas (Lee and Bostelman 1969). In the seven-county area, the Red Fox has been reported from improved pasture, citrus groves, dry prairie, sandhill, scrub, flatwoods, and developed areas. It has been most frequently recorded in citrus-sandhills and improved pasture habitats.

Population Status: The Red Fox is generally uncommon throughout most of the seven-county area, but it appears to be more abundant in the ridge section of Polk County and the northern portion of Hillsborough County. The species may also be relatively common in the pasture-flatwoods areas of eastern Hardee County. Brown (1974) stated that the Red Fox was common in various habitats in the Lower Hillsborough Flood Detention Area, whereas earlier Stevenson (1967) referred to it as a very rare transient in Hillsborough River State Park. The difference in the two assessments of the population in the same general region about seven years apart may reflect a recent build-up in numbers there. The Red Fox appears to be spreading its range and increasing its numbers throughout peninsular Florida.

Basis for Priority Status: The Red Fox is listed as biologically significant because of its apparent spread and increase in the seven-county area and potential impact on native species, particularly the Gray Fox. Some observers contend that Gray Foxes have become scarcer in areas where Red Foxes have appeared and become abundant (Edscorn 1976).

Potential Impacts of Mining: Unreclaimed phosphate-mined lands and mined areas reclaimed to pastureland and citrus groves would provide suitable habitat for this species, while perhaps being less favorable to the native Gray Fox. It is possible that extensive native habitat disturbance due to mining would contribute to the increase of the Red Fox in the seven-county area.

Selected References:

*Brown, L. N. 1974. Mammalian faunal assessment, Pages 67-80 *in* Cowell, B. C., *et al.*, Biological assessment of the Lower Hillsborough Flood Detention Area for recommendation of ecologically based land management. Univ. of So. Fla., Tampa. 111 pp.

*Edscorn, J. B. 1976. Avian highlights of the year. Lake Region Naturalist 1976-1977.

*Hall, E. R., and K. R. Kelson. 1959. The mammals of North America. 2 vols. Ronald Press, New York. 1083 pp.

*Hamilton, W. J., Jr. 1943. The mammals of eastern United States; an account of Recent land mammals occurring east of the Mississippi. Comstock Press, Ithaca, New York. 432 pp.

*Lee, D. S., and E. Bostelman. 1969. The Red Fox in central Florida. J. Mammal. 50: 161.

*Naggiar, M. 1976. The Red Fox. Fla. Wildl. 29(9): 2-4.

*Stevenson, J. A. 1967. A list of the vertebrates identified in Hillsborough River State Park. Fla. Brd. of Parks. 16 pp.

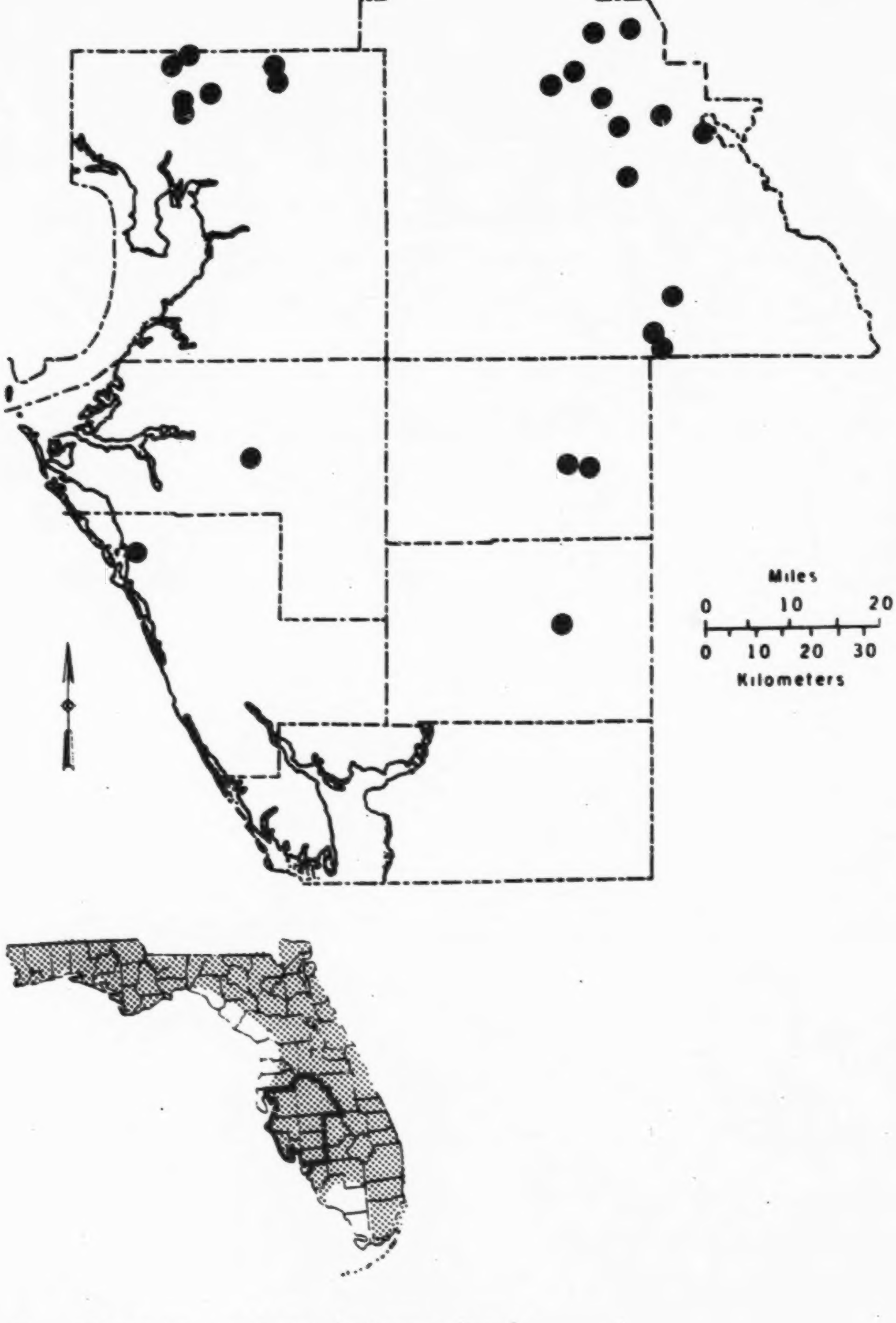
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Fig. VIII.E.24. RED FOX (Vulpes vulpes)

Game

GRAY FOX Urocyon cinereoargenteus Schreber

Order Carnivora Family Canidae

Distribution: The Gray Fox has been recorded in all counties in the seven-county area except Charlotte but undoubtedly occurs in the latter as well. The species occurs throughout the Florida mainland and throughout the entire eastern half of the United States, much of the western U.S., and southward to South America (Hall and Kelson 1959).

Habitat: The Gray Fox is most typical of wooded habitats, including swamps, hammocks, and pine forests, and is less inclined than the Red Fox to inhabit open areas (Hamilton 1943). No preference is shown for a single habitat type in the seven-county area, although about half of the records are from flatwoods and hammocks. Other habitats reported in the study area include oldfields, old phosphate-mined lands and other disturbed situations, and urban areas. Like other larger mammals, individual foxes generally utilize a variety of habitat types.

Population Status: The Gray Fox appears to be relatively uncommon in the seven-county area. Brown (1974) recorded it as abundant in the Lower Hillsborough Flood Detention Area, and it was listed as common on the Lamonte-Shimberg Bloomingdale tract near Brandon (Murray-McCormick Environ. Group 1974). However, Stevenson (1967) regarded it as rare in Hillsborough River State Park, and J. B. Funderburg (pers. comm.) stated that it was rare in the Orange Park phosphate mine area in 1962-1966. At Myakka River State Park the species was considered common in 1941 (Van Duyn 1941) but uncommon in 1976 (Fla. Dept. Nat. Res. 1976). This fox does not appear to be widespread nor very abundant in south Florida (Layne 1974).

Basis for Priority Status: The Gray Fox is a protected fur-bearer that may be hunted with a license by the use of dogs, but may not be taken by trapping or shooting (Fla. Game and Fresh Water Fish Comm.). The estimated statewide harvest of foxes (including this species and the Red Fox) in 1975-76 was 1004 ± 49, with none being recorded from the South Region containing the seven-county area (Conklin 1977). These figures are misleading as an indication of the sport value of foxes, however, as many hunters prefer to chase the foxes with hounds but not kill them.

Potential Impacts of Mining: This species requires the presence of woodlands, typically bordering open areas. Destruction of forested habitats by phosphate mining presumably would reduce the carrying capacity of the seven-county area for this species. Since the Red Fox may be more able to utilize unreclaimed and reclaimed lands than the Gray Fox, mining might increase possible competition between these species by encouraging further spread and increase of the Red Fox.

Selected References:

*Brown, L. N. 1974. Mammalian faunal assessment, Pages 67-80 *in* Cowell, B. C., *et al.*, Biological assessment of the Lower Hillsborough Flood Detention Area for recommendation of ecologically based land management. Univ. of So. Fla., Tampa. 111 pp.

*Conklin, E. J. 1977. Wildlife inventory, harvest and economic survey. Fla. Game and Fresh Water Fish Comm. Job Perform. Rept. 1-A-1. 12 pp.

*Florida Department of Natural Resources. 1976. Vertebrates of Myakka River State Park. 26 pp.

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*Murray-McCormick Environmental Group of Florida. 1974. Bloomingdale development of regional impact application. Prep. for Lamonte-Shimberg Corp., Tampa, Florida.

*Stevenson, J. A. 1967. A list of the vertebrates identified in Hillsborough River State Park. Fla. Brd. of Parks. 16 pp.

*Van Duyn, G. 1941. Progress report of biological reconnaissance Myakka River State Park, Florida (FLA SP-4) with preliminary check-lists of vertebrate fauna. 25 pp.

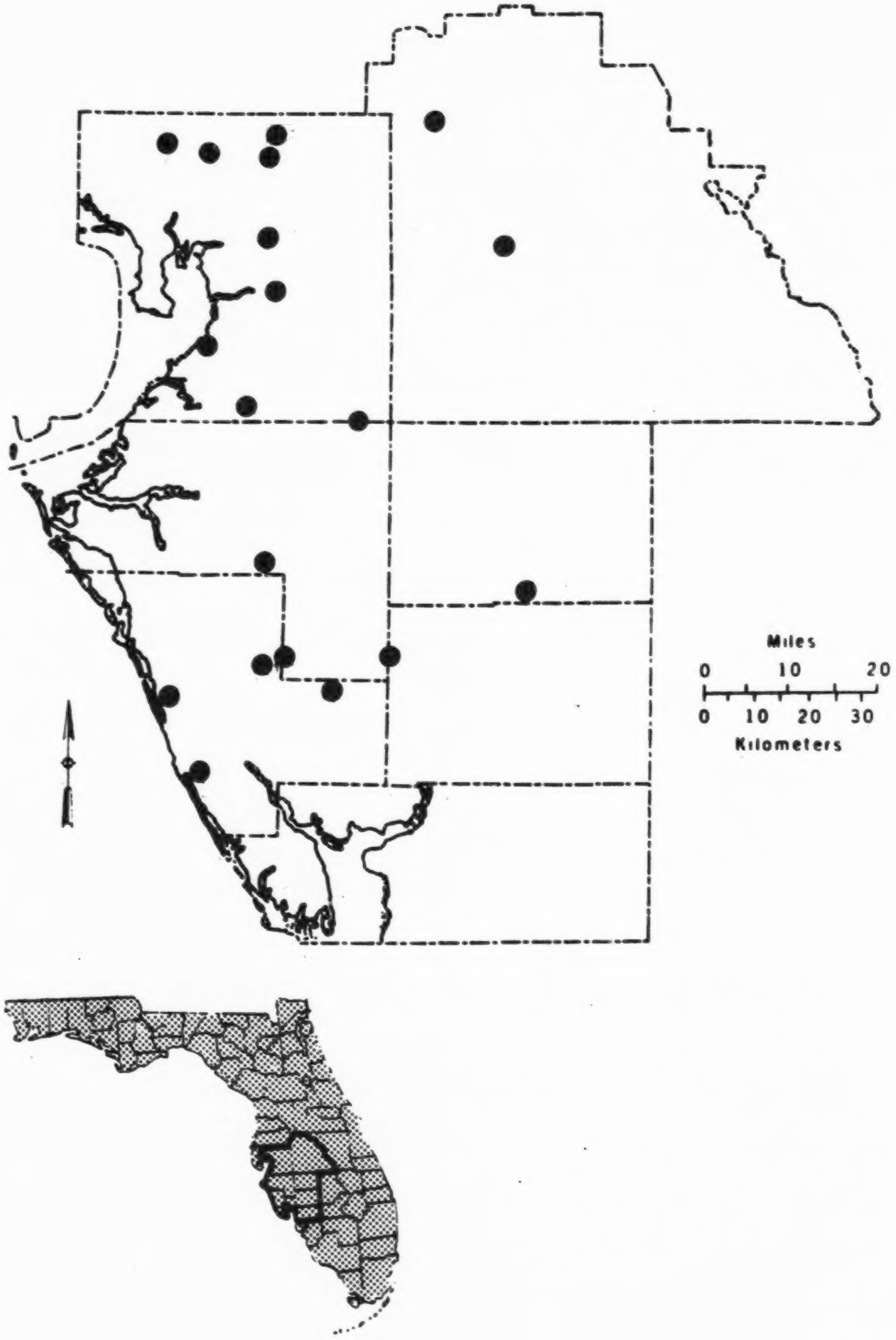
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Fig. VIII.E.25. GRAY FOX (Urocyon cinereoargenteus)

Listed - Threatened

FLORIDA BLACK BEAR | Ursus americanus floridanus Merriam

Order Carnivora | Family Ursidae

Distribution: Recent specific records of the Florida Black Bear, based upon sign, exist from Sarasota County near Old Miakka at the Crowley Nature Center (feeding on cabbage palm buds) and DeSoto County at Tropical River Groves (tracks and bee hive damage) (J. N. Layne pers. comm.). Williams (1976) also shows populations in portions of Hardee, Manatee, and Charlotte counties. The species also is thought to occur on the Avon Park Bombing Range in Polk and Highlands counties, but its presence there has not been confirmed (McMarrell and Ebersbach unpubl. MS.). This race formerly ranged throughout the seven-county area, all of Florida, and into southern Alabama and southern Georgia (Hall and Kelson 1959). Major population concentrations presently occur in the Apalachicola and Osceola national forests and Big Cypress Swamp. Habitat: Throughout their range, Florida Black Bears frequent the more forested areas (Williams 1976). These include a mixture of swamps, hammocks, flatwoods, scrub oak, mesophytic hardwoods, and mangroves along the coast (Harlow 1961, 1962; Anon. 1969; USDI 1969). Hamilton (1943) notes a preference for the almost impenetrable southern swamps. This race inhabits thickets and "bay galls" in south Florida, "swamps" in middle Florida, and "titi swamps" in the panhandle (Williams 1976). Formerly, beaches and canebrakes were utilized (Tebeau 1973, Williams 1837). Specific habitat data are not available for the two records in the seven-county area. However, the DeSoto County locality is in an area of native prairie, improved pastures, citrus groves, and scattered cabbage palm hammocks, while the Sarasota County locality is in a more densely forested area.

Population Status: There are no good data on the bear population of the seven-county area. Based on the scarcity of records, the species is very rare in the region. Estimates of the statewide population range from 500 to 1200 individuals. Between 1960 and 1969 estimates were 800 to 1200 (Harlow 1962, USDI 1969). In the 1970's estimates dropped to 500 to 600 individuals (Pelton and Nichols 1973, Goodwin 1975). Pelton and Nichols (1973) believed that of 500 bears in Florida, 33 percent were in the panhandle, 33 percent in northeast Florida, and 33 percent in the peninsula. The state parks and refuges are believed to contain 50 bears (Anon. 1969). Pelton and Nichols (1973) reported that in 1970, 50 Black Bears were legally killed in Florida. Bears are still legally hunted in Baker and Columbia counties in the Osceola National Forest. From 1970 to 1975, 7 to 13 bears, with an average of 10, were killed yearly (Anon. 1975). These mortality figures do not include illegal kills, principally by bee keepers and livestock owners, and accidental deaths, mainly highway mortality, which probably equal or exceed the legal harvest.

Basis for Priority Status: This race is listed as Threatened by the Florida Game and Fresh Water Fish Commission and the Florida Committee on Rare and Endangered Plants and Animals. The Black Bear population in Florida is on a steady downward trend as a result of habitat destruction coupled with continued killing.

Potential Impacts of Mining: Destruction of forest habitats, particularly dense swamps, by mining would be detrimental to the remaining Florida Black Bear population in the seven-county area and reduce the potential of the region to support a higher population at some future time. It would take a long period of time to redevelop suitable bear habitat on unreclaimed or reclaimed lands.

Selected References:

*Anon. 1969. Big game inventory for 1968. U. S. Dept. Int., Wildl. Leaflet 487. 4 pp.

*Anon. 1975. Wildlife management, Pages 20-25 *in* Florida Game and Fresh Water Fish Commission annual report July 1, 1974--June 30, 1975. Fla. Wildl. 29(6): 13-28.

*Goodwin, T. M. 1975. A consolidating research of the distribution, abundance, and natural history of thirty-four vertebrate species deemed threatened by the Florida Game and Fresh Water Fish Commission. Schl. of Forest Res. and Cons. Univ. of Fla., Gainesville. 91 pp.

*Hall, E. R., and K. R. Kelson. 1959. The mammals of North America. 2 vols. Ronald Press, New York. 1083 pp.

*Hamilton, W. J., Jr. 1943. The mammals of eastern United States; an account of Recent land mammals occurring east of the Mississippi. Comstock Press, Ithaca, New York. 432 pp.

*Harlow, R. F. 1961. Characteristics and status of Florida Black Bear. Trans. 26th N. Amer. Wildl. Conf. pp. 481-495.

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*McMarrell, C. E., and P. F. Ebersbach. Avon Park bombing and gunnery range multiple use resources management plan. Unpubl. MS.

*Pelton, M. R., and R. G. Nichols. 1973. Status of the Black Bear (*Ursus americanus*) in the southeast, Pages 18-23 *in* R. L. Miller, ed., Proceedings of the 1972 Black Bear Conference. N.Y. State Dept. of Env. Cons. Wildl. Res. Lab., Delmar, New York. 55 pp.

*Tebeau, C. W. 1973. Past environment from historical sources. So. Fla. Environ. Proj.: Ecol. Rept. No. DI-SFEP-74-03. 59 pp.

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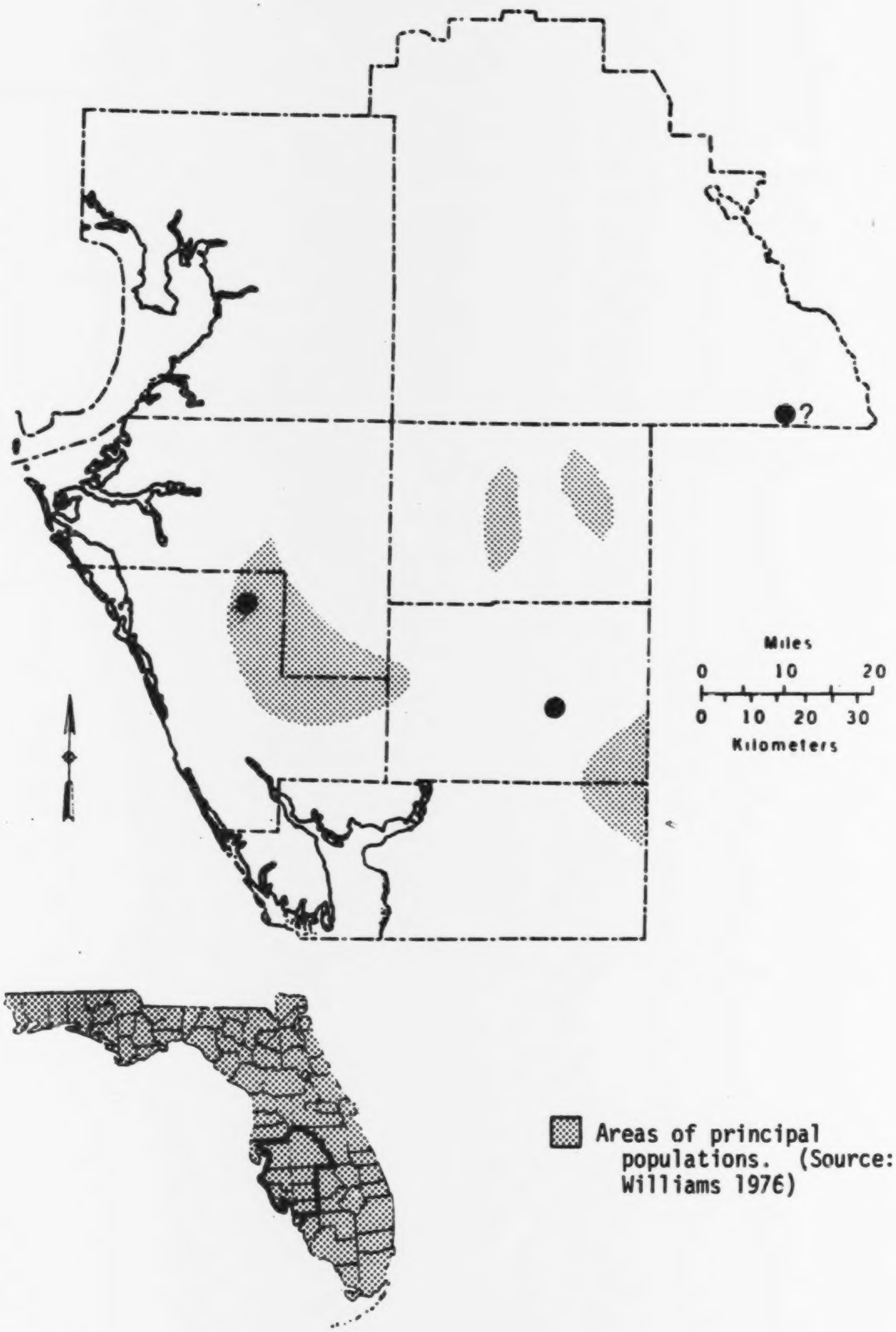
*Williams, J. L. 1837. Territory of Florida: or sketches of the topography, civil and natural history, of the country, the climate, and the Indian tribes from the first discovery to the present time. A. T. Goodrich, New York. 304 pp.

*Williams, L. E., Jr. 1976. Florida Black Bear, Pages 1052-1062 in Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

Worley, D. J., and J. N. Layne. 1975. Ursus americanus floridanus Merriam, 1896. MS prep. for Fla. Game and Fresh Water Fish Comm. in connection with Cross-Florida Barge Canal restudy. 20 pp.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▨ Areas of principal populations. (Source: Williams 1976)

Fig. VIII.E.26. FLORIDA BLACK BEAR (Ursus americanus floridanus)

Game and Commercial

RACCOON — *Procyon lotor* Linnaeus

Order Carnivora — Family Procyonidae

Other Names: Coon, Ringtail

Distribution: The Raccoon is widely distributed throughout the seven-county area, with specific records for all counties. This species is found throughout mainland Florida and the Florida Keys, and its overall range extends from southern Canada to Central America (Hall and Kelson 1959).

Habitat: Within the seven-county area, Raccoons have been recorded from most terrestrial habitat types, including phosphate-mined lands and developed areas. No particular habitat types predominate, although there is a tendency for records to be associated with wetlands or aquatic habitats, both freshwater and marine. The Raccoon is cosmopolitan in habitat throughout its range. Hamilton (1943) mentions that it is found wherever suitable conditions of woods, swamps, and streams provide acceptable food, and in the south it favors swamps and mangrove thickets. Dens and resting sites are typically in trees or in areas of thick vegetation.

Population Status: The Raccoon is abundant throughout the seven-county region. The only numerical population estimate for a locality within the study area appears to be that of Kappas *et al*. (1970), who estimated the population of Longboat Key, Manatee County, at 1000-3000 animals. All studies in the region giving qualitative estimates of abundance have classified it as common or abundant (*e.g*., Dames and Moore 1975, Long 1975, Stevenson 1967, Fla. Dept. Nat. Res. 1976, Brown 1974, Murray-McCormick Environ. Group 1974, J. B. Funderburg pers comm.).

Basis for Priority Status: The Raccoon is a game species in Florida. This species is also important in the fur trade, and thousands of Florida Raccoons are trapped and transported outside the state to hunters and hunting clubs in other states, such as North and South Carolina. The estimated statewide harvest of Raccoons in 1975-76 was 260,694 ± 109,726 or about 4 percent of the total of all 13 game species for which data were compiled by Conklin (1977). A relatively small proportion, about 11 percent, of the reported take was from the South Region, which includes the seven-county area. The extent of live-trapping of coons in the study area for shipment out of the state is not known.

Potential Impacts of Mining: Loss of forested areas and natural wetlands would reduce present Raccoon habitat in the study area. However, this adaptable species would readily utilize mined lands and reclaimed areas, provided sufficient food was available. Thus, mining would probably have no significant impact on its overall status in the seven-county area.

Selected References:

*Brown, L. N. 1974. Mammalian faunal assessment, Pages 67-80 in Cowell, B. C., et al., Biological assessment of the Lower Hillsborough Flood Detention Area for recommendation of ecologically based land management. Univ. of So. Fla., Tampa. 111 pp.

*Conklin, E. J. 1977. Wildlife inventory, harvest and economic survey. Fla. Game and Fresh Water Fish Comm. Job Perform. Rept. 1-A-1. 12 pp.

*Dames and Moore. 1975. Hydrobiologic assessment of the Alafia and Little Manatee rivers. Report prep. for the Southwest Fla. Water Management Dist. by Dames and Moore, Consulting Engineers, Atlanta, Georgia.

*Florida Department of Natural Resources. 1976. Vertebrates of Myakka River State Park. 26 pp.

*Hall, E. R., and K. R. Kelson. 1959. The mammals of North America. 2 vols. Ronald Press, New York. 1083 pp.

*Hamilton, W. J., Jr. 1943. The mammals of eastern United States; an account of Recent land mammals occurring east of the Mississippi. Comstock Press, Ithaca, New York. 432 pp.

*Kappas, K. D., W. J. Bigler, R. G. McLean, and H. A. Trevino. 1970. The Raccoon, an emerging rabies host. J. Wildl. Dis. 6: 507-509.

*Long, R. W. 1975. A biological assessment of Beacon Key, Florida. Tampa Elec. Co. Unpubl. MS. 264 pp.

*Murray-McCormick Environmental Group of Florida. 1974. Bloomingdale development of regional impact application. Prep. for Lamonte-Shimberg Corp., Tampa, Florida.

*Stevenson, J. A. 1967. A list of the vertebrates identified in Hillsborough River State Park. Fla. Brd. of Parks. 16 pp.

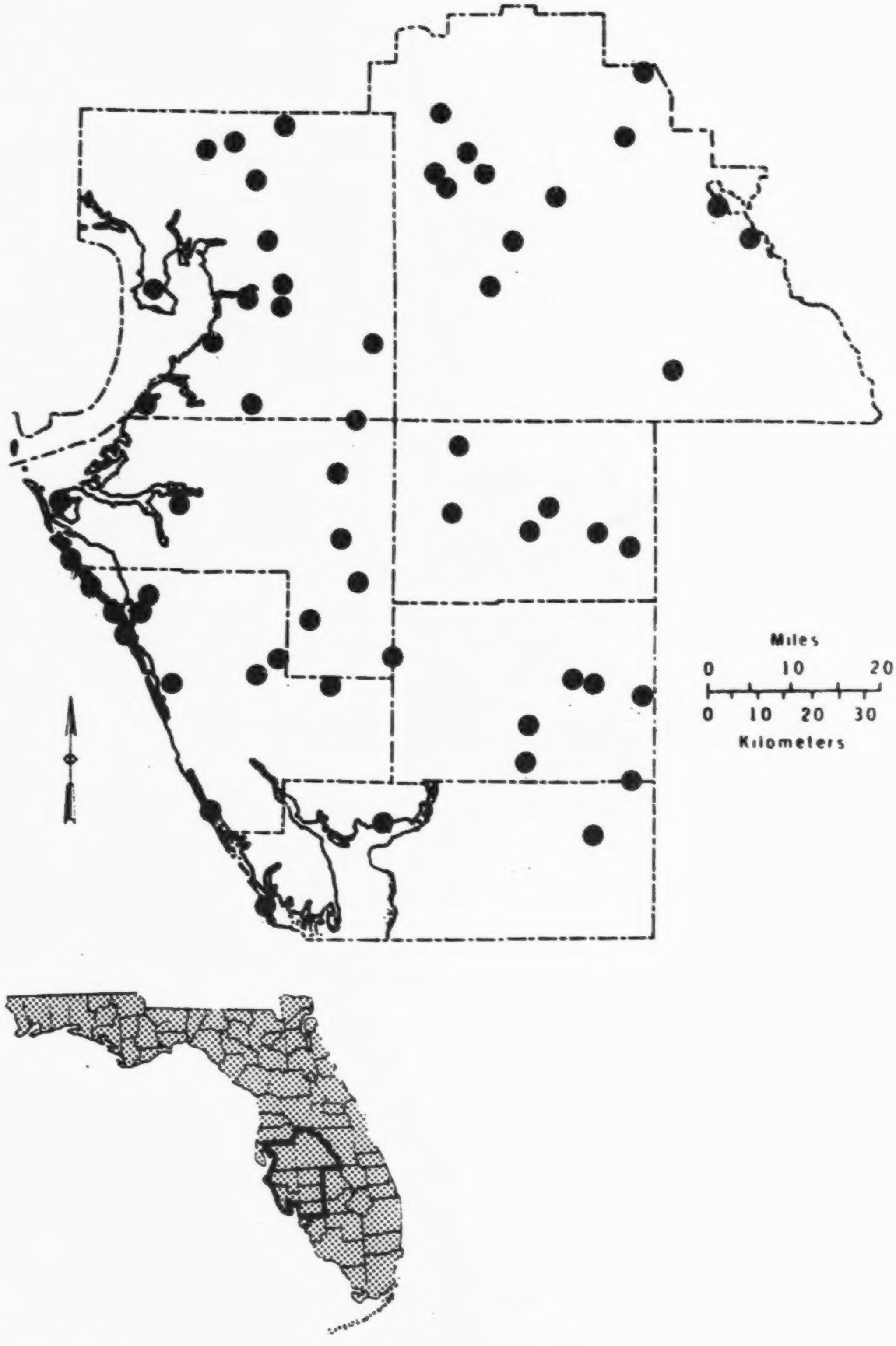
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Fig. VIII.E.27. RACCOON (*Procyon lotor*)

Listed - Rare

FLORIDA LONG-TAILED WEASEL — *Mustela frenata peninsulae* (Rhoads)

Order Carnivora — Family Mustelidae

Other Names: Florida Weasel, Peninsular Weasel

Distribution: Records exist for Hillsborough, Manatee, Sarasota, Hardee, and Polk counties. This race is restricted to the southern two-thirds of peninsular Florida from about Citrus, southern Marion, and Volusia counties south to middle Collier County on the west coast and Indian River County on the east coast (Brown 1976). The species has a very broad range, occurring in most areas of North America from southern Canada through Central America to South America (Hall and Kelson 1959).

Habitat: According to Moore (1945), the Florida weasel has no distinct habitat preference but tends to occur in habitats of the small mammals it preys upon. It has been recorded from pinelands, hardwood swamps, tropical hammocks, and sand pine scrub areas (Brown 1976). Recorded habitats in the seven-county area include freshwater marsh, swamp forest, oldfields and citrus groves, hammocks, and pine flatwoods.

Population Status: Based on the number of specimens that have been collected or observed, the Long-tailed Weasel is very rare in the seven-county area. Specific reference to its population status in the region are contained in Brown (1974) and Florida Department of Natural Resources (1976), where it is listed as rare. Layne (1974) believed this species to be nowhere common in Florida and that its numbers decrease from north to south in the peninsula. Brown (1972) considered it one of the state's rarest carnivores. There is no evidence of any long term trend in the population, and the apparent scarcity of the species cannot be attributed to human agency.

Basis for Priority Status: This weasel is listed as Rare by the Florida Committee on Rare and Endangered Plants and Animals.

Potential Impacts of Mining: Because of its rarity and apparent habitat versatility, this species would probably not be significantly affected by mining activity. Given sufficient prey populations, it would probably adapt to unreclaimed areas undergoing natural succession and some of the seminatural environments created in reclamation.

Selected References:

*Brown, L. N. 1972. Florida's rarest carnivore. Fla. Wildl. 25(11): 4-6.

*Brown, L. N. 1974. Mammalian faunal assessment, Pages 67-80 *in* Cowell, B. C., *et al*., Biological assessment of the Lower Hillsborough Flood Detention Area for recommendation of ecologically based land management. Univ. of So. Fla., Tampa. 111 pp.

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*Florida Department of Natural Resources. 1976. Vertebrates of Myakka River State Park. 26 pp.

*Hall, E. R., and K. R. Kelson. 1959. The mammals of North America. 2 vols. Ronald Press, New York. 1083 pp.

*Layne, J. N. 1974. The land mammals of south Florida, Pages 386-413 _in_ Gleason, P. J., ed., Environments of south Florida: present and past. Miami Geol. Soc. Memoir 2. 452 pp.

*Moore, J. C. 1945. Life history notes on the Florida weasel. Proc. Fla. Acad. Sci. 7: 247-263.

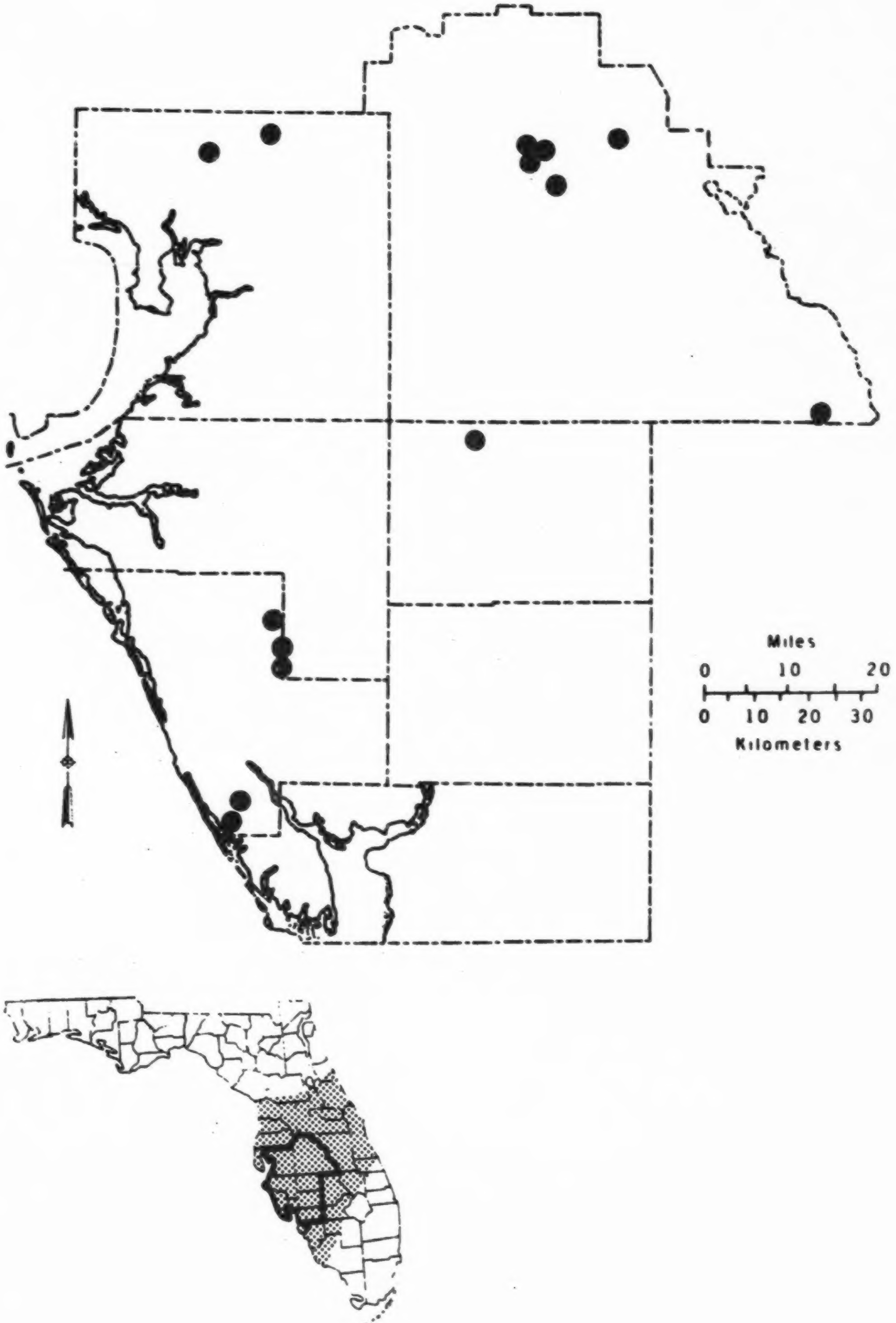
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Fig. VIII.E.28. FLORIDA LONG-TAILED WEASEL (*Mustela frenata peninsulae*)

Commercial

STRIPED SKUNK — *Mephitis mephitis* (Schreber)

Order Carnivora — Family Mustelidae

Other Names: Polecat

Distribution: Records of the Striped Skunk exist for all counties in the seven-county area except Charlotte, although it undoubtedly occurs in the latter county as well. This species occurs throughout the Florida mainland and possibly onto Key Largo in the Florida Keys. Its overall range includes North America from southern Canada to northern Mexico (Hall and Kelson 1959).

Habitat: In the seven-county area, the Striped Skunk has been recorded most often in pine flatwoods. Other habitats include improved pasture, dry brushlands, mixed hardwoods, river floodplain, sand ridges, palmetto prairies, old phosphate mine areas, and citrus groves. In southern Florida, this skunk is found in high pinelands and occasionally hammocks and open glades (Schwartz 1952).

Population Status: The Striped Skunk is generally distributed but uncommon in the seven-county area, but may be common in suitable habitat in some localities. It was common on the Lamonte-Shimberg Bloomingdale tract (Murray-McCormick Environ. Group 1974). Stevenson (1967) noted that it was very rare in Hillsborough River State Park, while Brown (1974) found it abundant in the Lower Hillsborough Flood Detention Area and gave density estimates of 0 to 2 per acre in river floodplain forest and 0 to 1 per acre in pine flatwoods, depending on season. It is regarded as rare in Myakka River State Park (Fla. Dept. Nat. Res. 1976). J. B. Funderburg (pers. comm.) considered it to be rare in the Orange Park phosphate mine area of Polk County in 1962-66.

Basis for Priority Status: The Striped Skunk is a commercial species that is harvested for its fur. Partial data on fur harvests from 1941-1960 reveal that the 1947-48 season was heaviest with 2223 skunks (the majority probably Striped) taken. The mean number of skunks taken during these 19 years was about 700. Post-1960 records indicate skunks taken only during 1968-69 (15), 1969-70 (104), and 1975-76 (3) (J. Brady pers. comm.).

Potential Impacts of Mining: The removal of forested areas, particularly pine flatwoods, by phosphate mining activities would probably reduce the regional carrying capacity for the Striped Skunk. Presumably the species would make use of unreclaimed mined lands left to natural succession and some types of semi-natural habitats created in reclamation.

Selected References:

*Brown, L. N. 1974. Mammalian faunal assessment, Pages 67-80 in Cowell, B. C., et al., Biological assessment of the Lower Hillsborough Flood Detention Area for recommendation of ecologically based land management. Univ. of So. Fla., Tampa. 111 pp.

*Florida Department of Natural Resources. 1976. Vertebrates of Myakka River State Park. 26 pp.

*Hall, E. R., and K. R. Kelson. 1959. The mammals of North America. 2 vols. Ronald Press, New York. 1083 pp.

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*Murray-McCormick Environmental Group of Florida. 1974. Bloomingdale development of regional impact application. Prep. for Lamonte-Shimberg Corp., Tampa, Florida.

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*Stevenson, J. A. 1967. A list of the vertebrates identified in Hillsborough River State Park. Fla. Brd. of Parks. 16 pp.

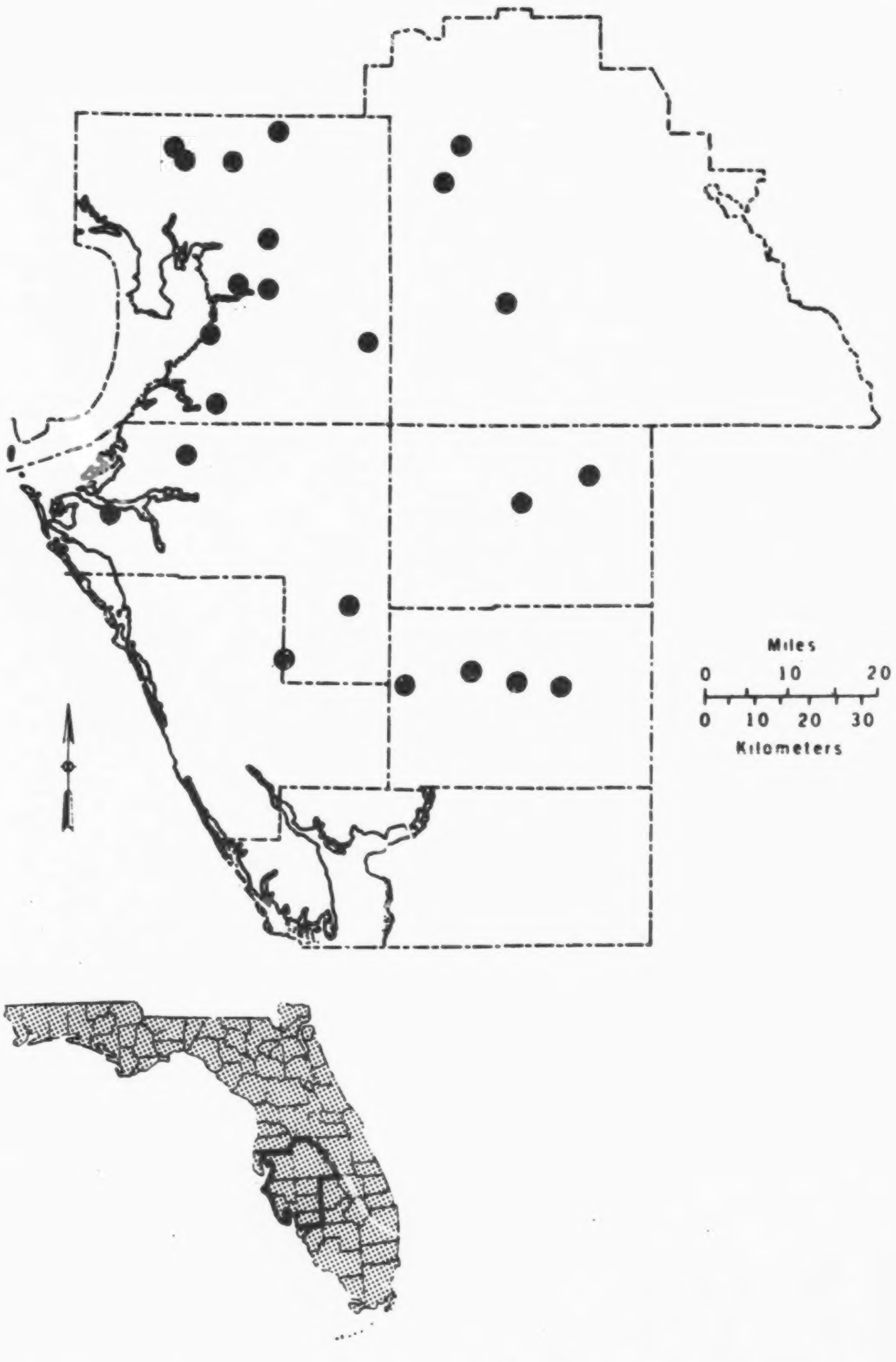
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Fig. VIII.E.29. STRIPED SKUNK (Mephitis mephitis)

Game and Commercial

RIVER OTTER Lutra canadensis Schreber

Order Carnivora Family Mustelidae

Other Names: Land Otter

Distribution: The River Otter has been recorded from all seven counties except Charlotte and Hardee. The lack of records from the latter two counties reflects inadequate collecting and observation effort rather than the fact that the species is absent from these counties. The otter is distributed throughout mainland Florida and occurs widely in North America from Alaska and northern Canada southward almost to the Mexican border (Hall and Kelson 1959).

Habitat: The River Otter is rarely found far from water, spending the majority of its time in and around lakes, rivers, streams, canals, and drainage ditches. It will, however, travel extensively over land between suitable aquatic habitats. Otters occur regularly in fresh, brackish, and even salt water habitats (Layne 1974). Within the seven-county area, otters have been observed in mixed swamps, freshwater marshes, wet prairies, coastal scrub, mangroves, sloughs, lakes and ponds, streams, ditches, and canals. They have frequently been reported from phosphate pits and slime settling ponds.

Population Status: The otter is generally uncommon in the seven-county area as a whole. However, in certain aquatic habitats it may be relatively common. Brown (1974) rated it as common in the Lower Hillsborough Flood Detention Area, but Stevenson (1967) considered it only occasional in Hillsborough River State Park. It is regarded as uncommon in Myakka River State Park (Fla. Dept. Nat. Res. 1976). Dames and Moore (1975) reported it as uncommon to rare in various habitats in the Alafia and Little Manatee river basins. J. B. Funderburg (pers. comm.) considered otters to be rare in the Orange Park phosphate area in 1962-66, but a relatively high number of more recent sightings (e.g., B. Kittleson pers. comm., J. N. Layne pers. comm., F. Montalbano pers. comm.) in phosphate pits and slime ponds suggests that the species is rather common in these environments.

In south Florida, the otter is one of the most common carnivores, although there has been an overall decline in numbers due to current extensive drainage programs (USDI 1969). Lowman (1975) concluded that after decades of low numbers, the River Otter has recovered in most areas.

Basis for Priority Status: The River Otter is a protected fur bearer in Florida. Incomplete harvest data from 1937 to 1976 show from 192 in 1945-46 to 7000 in 1967-68. The recorded 1975-76 catch was 856, the highest since 1967-68 (J. Brady pers. comm.). These figures must be regarded as minimum estimates. Harvest data for the seven-county area are not available.

Potential Impacts of Mining: Extensive disruption of natural wetlands and aquatic habitats by mining activities would be potentially detrimental to the otter population of the seven-county area. Included among effects of mining that could adversely impact otters are actual mining of wetlands and aquatic habitats, drainage or dewatering wetland areas as a result of mining, modification of hydroperiods of streams and rivers, and accidental slime spills. Slime settling ponds and other water bodies of unreclaimed mined areas and some of the artificial aquatic habitats created by reclamation would provide favorable habitat. In areas with few natural aquatic habitats, mining might result in an increase in the otter population.

Selected References:

*Brown, L. N. 1974. Mammalian faunal assessment, Pages 67-80 in Cowell, B. C., et al., Biological assessment of the Lower Hillsborough Flood Detention Area for recommendation of ecologically based land management. Univ. of So. Fla., Tampa. 111 pp.

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*Harris, C. J. 1968. Otters. A study of Recent Lutrinae. Weidenfield and Nicolson, London. 397 pp.

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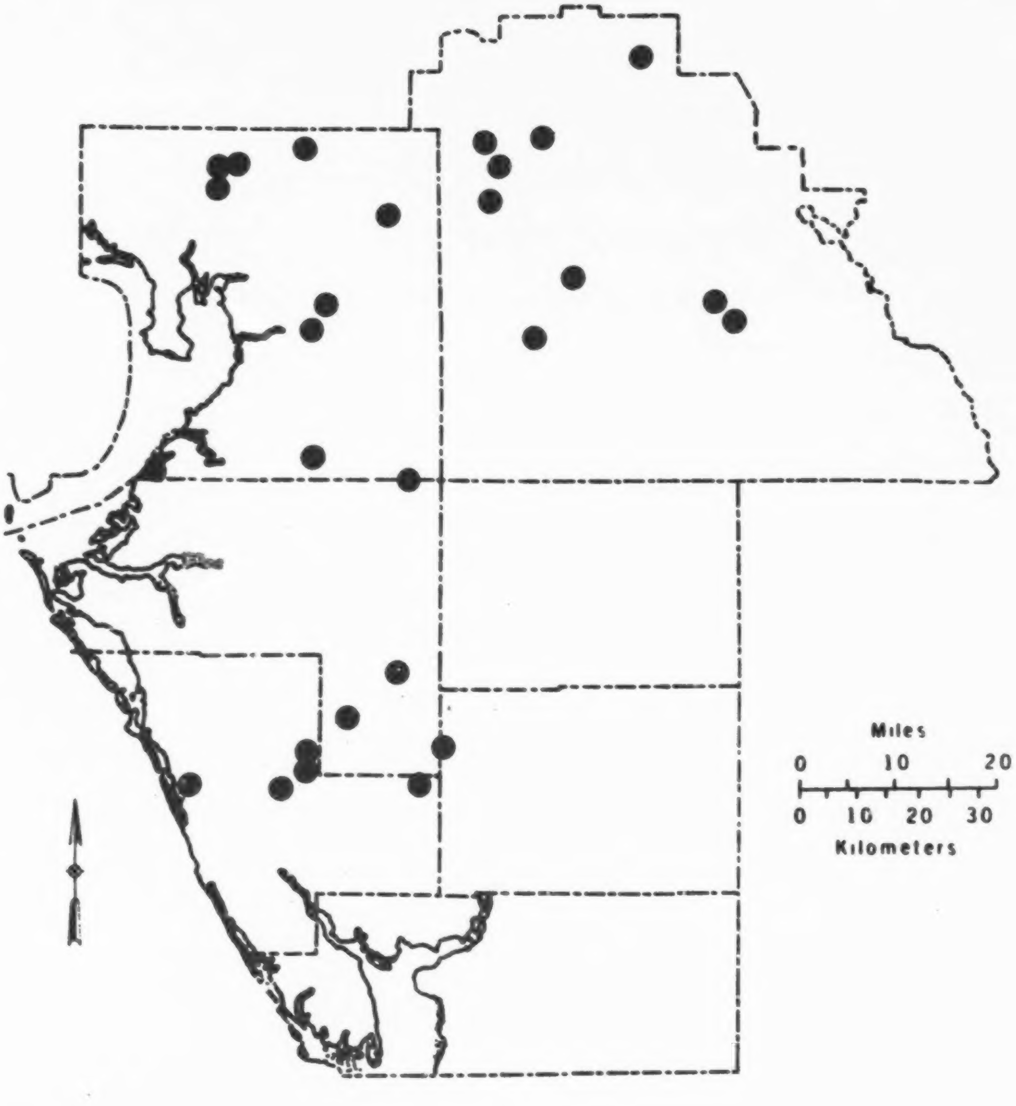
*Stevenson, J. A. 1967. A list of the vertebrates identified in Hillsborough River State Park. Fla. Brd. of Parks. 16 pp.

*United States Department of the Interior. 1969. Environmental impact of the Big Cypress Swamp jetport. 155 pp.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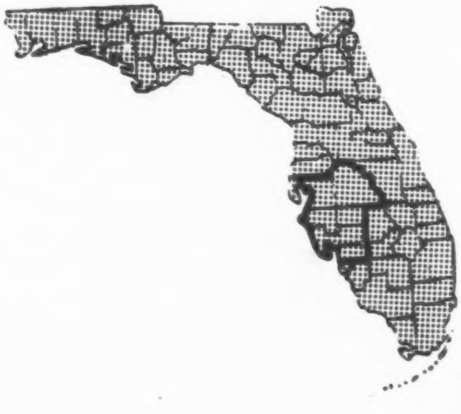


Fig. VIII.E.30. RIVER OTTER (Lutra canadensis)

Listed - Endangered

FLORIDA PANTHER

Order Carnivora

Felis concolor coryi Bangs

Family Felidae

Other Names: Cougar, Puma, Mountain Lion

Distribution: The current distribution of this elusive animal is difficult to determine, especially so because of its rarity. The Archbold Biological Station has compiled published and unpublished Florida Panther records from throughout Florida. These records consist primarily of sightings, but also include reports of actual specimens, tracks, scats, and other evidence of panthers. The fact that these records are largely unverified admittedly detracts from their value as indicators of population size and distribution, but they constitute the most comprehensive body of data on the status of this species currently available. A total of 83 panther records covering the period 1961-1976 have been obtained from the seven-county area, with one or more records from all counties except Hardee. These records include two reports of actual specimens from Sarasota County, neither of which apparently was collected, and one specimen from DeSoto County in 1965 which was reputedly turned over to a Florida Game and Fresh Water Fish Commission biologist. During the past six years, 56 Florida Panther records have been reported from the seven-county area, with records from all counties except Hardee. The bulk (71 percent) of these records have been from Sarasota County, primarily from Myakka River State Park and vicinity. Fourteen percent of the records were from Polk County and 5 percent or less of the records were from each of the other counties.

Within the seven-county area there appear to be two major population concentrations, one in the Myakka River Valley in Sarasota and Manatee counties and the other in the Lake Kissimmee State Park area in Polk County.

Based on recent alleged sightings and a few confirmed records of specimens or tracks of Florida Panthers, the range appears to cover the entire state, with clusters of records that may indicate established populations in the areas of Sarasota-Manatee and Polk counties mentioned above, in Everglades National Park in Dade and Monroe counties, and the Fakahatchee Strand and general Big Cypress area in Collier County.

The Florida Panther originally ranged over the southeastern United States from eastern Texas or western Louisiana and the lower Mississippi River Valley east through the southeastern states, including Arkansas, Louisiana, Mississippi, Alabama, Georgia, and parts of Tennessee and South Carolina (Goldman 1946). The current distribution of coryi outside of Florida is unknown, but there have been recent reports from localities throughout the historic range, including Alabama, Arkansas, Georgia, Louisiana, Mississippi, and Missouri (Layne and McCauley 1976).

Felis concolor once had one of the most extensive ranges of any terrestrial North American mammal,occurring from Canada south throughout the United States, Mexico, central America, and South America to Patagonia (Hall and Kelson 1959).

Habitat: The Florida Panther has been reported from every major terrestrial habitat association in Florida (Layne and McCauley 1976) and appears to show no habitat preference other than one for undeveloped areas. Williams (1976) noted that the Florida Panther range and habitat coincided with that of the White-tailed Deer (Odocoileus virginianus). As in the case of other larger predators, individual panther home ranges encompass a variety of habitats.

Within the seven-county area, panthers have been reported from suburban-residential areas (Leposky 1975), hammocks, dense mixed scrub oak and pine flatwoods, pine and hardwoods, Australian pine-mangroves, citrus groves, hydric hammock, longleaf pine flatwoods, longleaf pine-turkey oak, low scrub-palmettos, swamps-sloughs, lake shore, and tall-grass pastures.

The relatively large number of records from the riverine forests along the Myakka River and its tributaries suggests that panthers may use these dense forests as travelways through more open areas (Layne and McCauley 1976).

Population Status: It is impossible to estimate the panther population of the seven-county area. Based on evidence gathered by Alvarez (pers. comm.), panthers first appeared in the Myakka River State Park area in the late 1940's. The Florida Panther is very rare throughout its range and estimates of the number currently existing in Florida range from 30 to 300. Williams (1976) believes that not more than 50 individuals remain in the state. The population declined drastically from its original size with the settlement of Florida. The major factor in this decline was undoubtedly depredation by man. Habitat loss probably also was involved and is becoming an increasingly significant factor influencing the status of the Florida Panther.

The panther has been fully protected by law in Florida since 1958. On the basis of a review of the literature and analysis of unpublished records, Layne and McCauley (1976) suggested that the Florida Panther population declined steadily from at least the late 1800's until the mid-1950's, and that in recent years there is a suggestion that the population has stabilized or increased somewhat, as a result of legal protection and changing public attitudes about predatory animals. They suggested that the present Florida population may be 100-200 individuals. A thorough study of the Florida Panther is urgently needed to determine its true status.

Basis for Priority Status: The Florida Panther is classified as Endangered by the United States Department of the Interior, Florida Committee on Rare and Endangered Plants and Animals, and International Union for the Conservation of Nature and Natural Resources. Two of the few apparent remaining population centers of this species are found within the seven-county area. The continued existence and protection of these areas, particularly the Myakka River Valley, may be vital to the survival of *F. c. coryi*.

Potential Impacts of Mining: Any mining activities resulting in the degradation of natural habitats in the Myakka River Valley and along the Kissimmee River could potentially have a serious adverse impact on the Florida Panthers believed to inhabit these areas. Of particular importance in the Myakka River Valley is the preservation of hammock strands along creeks and streams in the upper portions of the drainage basin where forested habitats are scarcer. These wooded stream courses are believed to be important to panthers as cover and travelways, as many of the records in this region are in or close to such habitats.

Selected References:

*Goldman, E. A. 1946. Pages 175-302 *in* Young, S. P., and E. A. Goldman, The Puma, mysterious American cat. Reprinted (1964) by Dover Publ., Inc., New York. 358 pp.

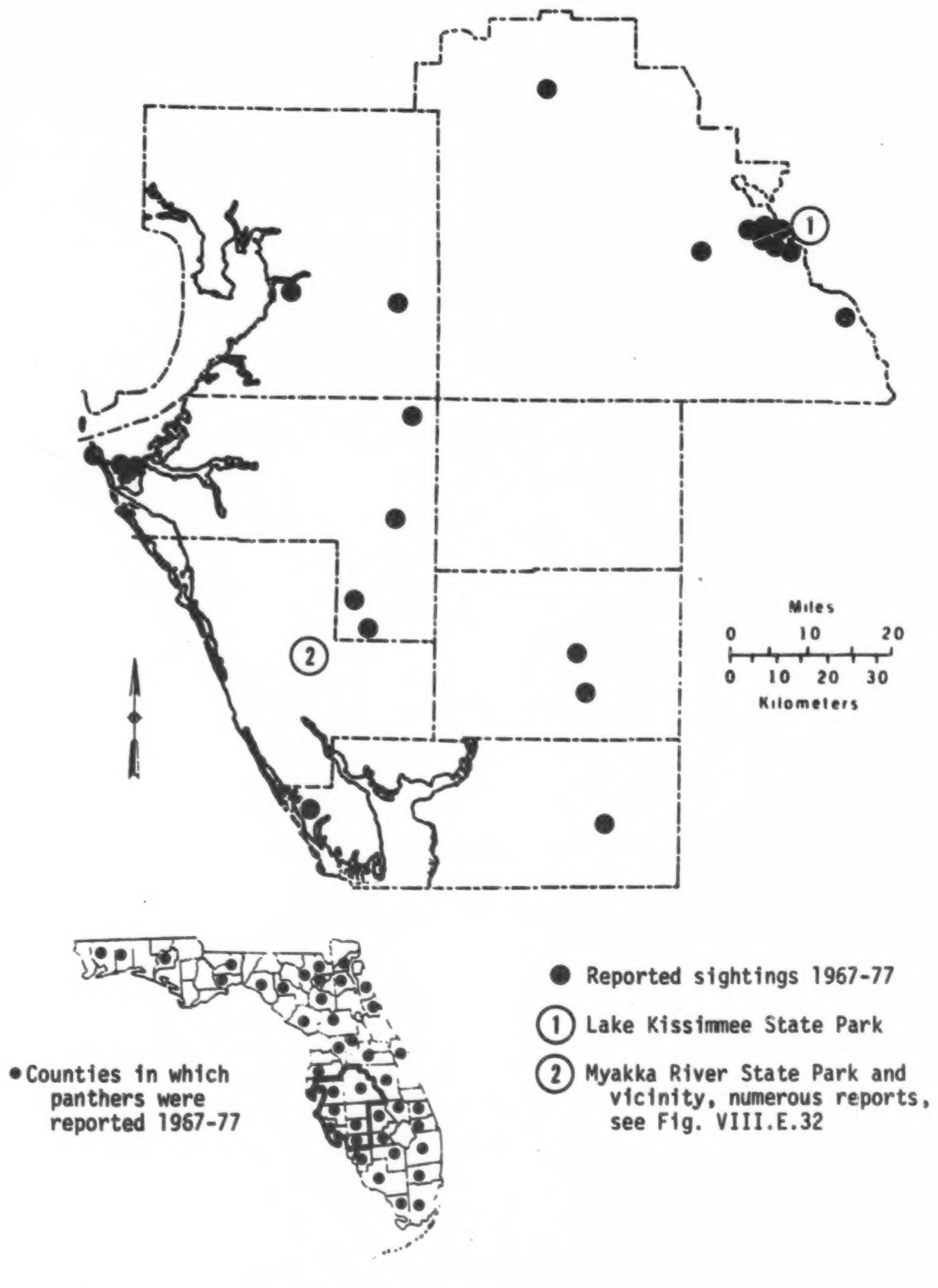
*Hall, E. R., and K. R. Kelson. 1959. The mammals of North America. 2 vols. Ronald Press, New York. 1083 pp.

*Layne, J. N., and M. N. McCauley. 1976. Biological overview of the Florida Panther. Paper presented at the Florida Panther Conference, Orlando, Florida. 17-18 March 1976. 35 pp.

*Leposky, G. 1975. Have you seen this cat? St. Petersburg Times Floridian Mag., 8 June: 14-16.

Tinsley, J. B. 1970. The Florida Panther. Great Outdoors Publ. Co., St. Petersburg, Florida. 60 pp.

*Williams, L. E., Jr. 1976. Florida Panther, Pages 1019-1025 _in_ Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.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● Reported sightings 1967-77
① Lake Kissimmee State Park
② Myakka River State Park and vicinity, numerous reports, see Fig. VIII.E.32
● Counties in which panthers were reported 1967-77

Fig. VIII.E.31. FLORIDA PANTHER (*Felis concolor coryi*)

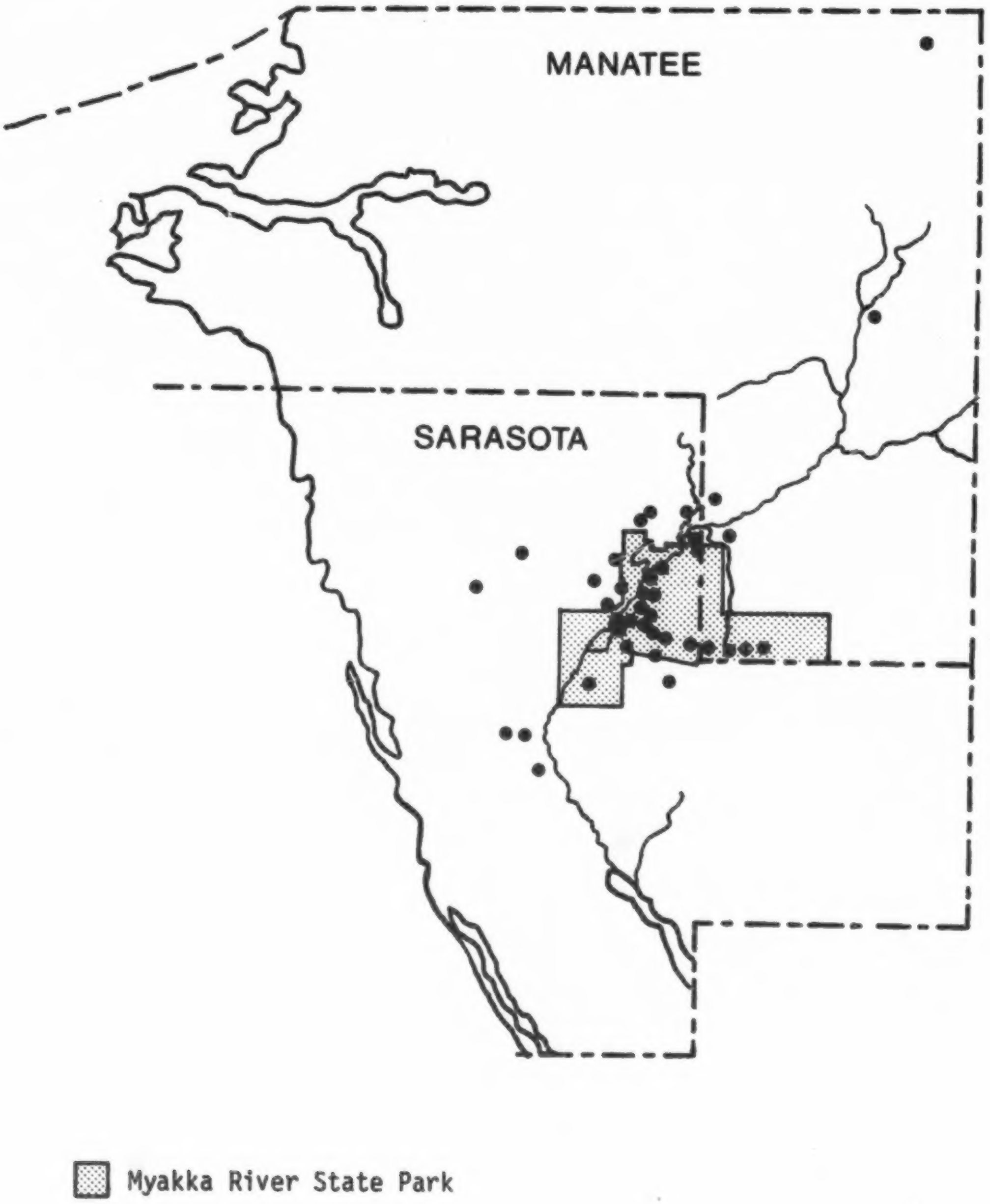
MANATEE
SARASOTA
▨ Myakka River State Park

Fig. VIII.E.32. FLORIDA PANTHER (*Felis concolor coryi*). Reported sightings (1967-77) in the Myakka River Valley area.

Biologically Significant

BOBCAT — *Felis rufus* Schreber

Order Carnivora — Family Felidae

Other Names: Wildcat, Bay Lynx. In much of the literature, the scientific name *Lynx rufus* is used for this species.

Distribution: The Bobcat is generally distributed throughout the seven-county area, with actual records from all counties except Charlotte. It undoubtedly occurs in this county as well. The species occurs throughout Florida, including the upper Keys (Layne 1974). The overall range covers entire North America from southern Canada to Mexico (Hall and Kelson 1959).

Habitat: Bobcats are found in all forested and mixed woodland and open country areas of the state. Individual cats normally range through a variety of habitats. Within the seven-county area, the species has been reported from pine flatwoods, oak hammocks, cypress heads, bayheads, freshwater marsh, mangroves, swamp thickets, coastal scrub, improved pastures, sand flats, and unreclaimed phosphate mine areas, with no one habitat-type predominating.

Population Status: The species is apparently relatively common in undisturbed areas throughout the seven-county area. It has been reported as abundant in the Lower Hillsborough Flood Detention Area (Brown 1974), common in Myakka River State Park (Fla. Dept. Nat. Res. 1976) and the Lamonte-Shimberg Bloomingdale tract (Murray-McCormick Environ. Group 1974), rare in Hillsborough River State Park (Stevenson 1967) and the Orange Park phosphate mine area (J. B. Funderburg pers. comm.), and occasional in the Borden Big Four Mine area in southwest Polk County (Borden Phosphate 1975). Although the

Bobcat appears to be declining alarmingly in some parts of its range, it appears to be holding its own in Florida.

Basis for Priority Status: The Bobcat is an important predator species and, as a top carnivore, serves as a valuable indicator of the status of the natural ecosystems to which it belongs.

Potential Impacts of Mining: It is unlikely that phosphate mining would have a direct effect on Bobcat populations except for local disruption of home ranges and social organization at active mine sites. Given adequate prey populations, the species would readily utilize unreclaimed mine lands undergoing natural succession or semi-natural reclaimed areas.

Selected References:

*Borden Phosphate. 1975. Big Four Mine. Development of regional impact application.

*Brown, L. N. 1974. Mammalian faunal assessment, Pages 67-80 in Cowell, B. C., et al., Biological assessment of the Lower Hillsborough Flood Detention Area for recommendation of ecologically based land management. Univ. of So. Fla., Tampa. 111 pp.

*Florida Department of Natural Resources. 1976. Vertebrates of Myakka River State Park. 26 pp.

*Hall, E. R., and K. R. Kelson. 1959. The mammals of North America. 2 vols. Ronald Press, New York. 1083 pp.

*Layne, J. N. 1974. The land mammals of south Florida, Pages 386-413 in Gleason, P. J., ed., Environments of south Florida: present and past. Miami Geol. Soc. Memoir 2. 452 pp.

*Murray-McCormick Environmental Group of Florida. 1974. Bloomingdale development of regional impact application. Prep. for Lamonte-Shimberg

Corp., Tampa, Florida.

*Stevenson, J. A. 1967. A list of the vertebrates identified in Hillsborough River State Park. Fla. Brd. of Parks. 16 pp.

*Young, S. P. 1958. The Bobcat of North America. Stackpole Co., Harrisburg, Pennsylvania. 193 pp.

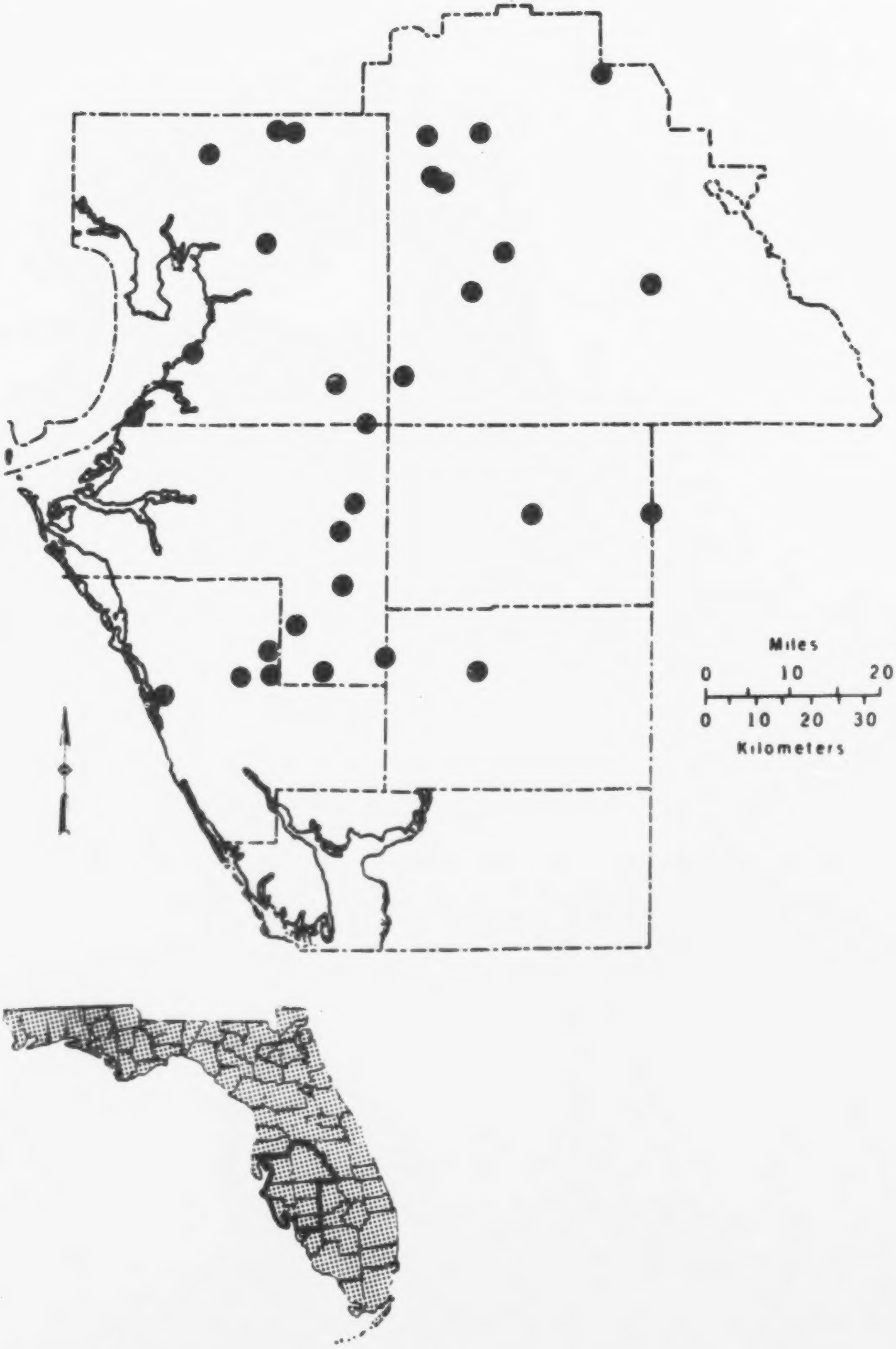
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Fig. VIII.E.33. BOBCAT (*Felis rufus*)

Listed - Endangered, Threatened, Vulnerable

MANATEE

Trichechus manatus Linnaeus

Order Sirenia

Family Trichechidae

Other Names: Sea Cow, West Indian Manatee

Distribution: Records of the Manatee exist for Hillsborough, Manatee, Sarasota, Charlotte, and DeSoto counties. From 1971-1973, Hartman (1974) recorded Manatees in the seven-county area from the following localities:

Charlotte County - coastal, Charlotte Harbor, lower Peace and Myakka rivers
DeSoto County - Peace River to the S.R. 761 bridge
Sarasota County - coastal, upper reaches of Myakka River
Manatee County - coastal, up the Manatee River
Hillsborough County - coastal, Hillsborough Bay, Little Manatee River, Alafia River, Hillsborough River.

Hartman (1974) reported winter congregations in the seven-county area at the Big Bend Generating Plant at Apollo Beach and the Cities Service Phosphate Plant on the north bank of the Alafia River, both in Hillsborough County. J. Reynolds (pers. comm.) observed groups of about seven individuals in the lower Peace River at Liverpool, DeSoto County, during the late 60's and early 70's. A concentration of at least 20 individuals was observed during the winter of 1976-77 in the vicinity of the warm water outlet of the U. S. Phosphoric Company at Gibsonton, Hillsborough County (Tampa Tribune 25 January 1977).

The general range of the species includes the Atlantic and Gulf coasts of the Florida peninsula and the Gulf, Caribbean, and Atlantic coasts of Central and South America from Mexico to northern Brazil (Hartman 1976).

The particulars of its distribution in the West Indies are not clear. On the Gulf coast of Florida, the range of the Manatee is continuous from the Everglades to Charlotte Harbor. North of the latter area, semi-isolated populations are located in Hillsborough, Citrus, and Levy counties. Charlotte Harbor is an area of particular abundance.

Habitat: Manatees typically inhabit coastal regions, freely entering lagoons, marine and fresh water estuaries, and rivers up to 100 miles from the coast (Bertram and Bertram 1973). Almost any waterway connected to the ocean may be utilized if it is of sufficient depth. Campbell (1976) notes that the Manatee cannot tolerate water temperatures below 18° C. For this reason, congregations often form at areas of warmer outflows such as springs and power plant discharges in colder winter months. Turbid waters seem to have no effect on the species (Husar 1977). Major factors appearing to affect choice of habitat are: 1) availability of plant food items, 2) proximity to channels of at least 2 meter depth, 3) access to warm water during winter cold snaps, and 4) a source of fresh water (Hartman 1976). Manatees are known to move through polluted waters, and the principal adverse impact of pollution on the species is through reduction of food plants from sedimentation or other effects (Hartman 1974). Hartman cites sedimentation from dredging operations and industrial wastes as apparently being responsible for the elimination of marine spermatophytes from Hillsborough and McKay Bays with the consequent reduction of Manatees.

Population Status: Hartman (1974) found the Manatee "especially common" in portions of Charlotte Harbor, Charlotte County; common in the upper reaches of the Peace River from the DeSoto-Charlotte County line to the

S. R. 761 bridge, DeSoto County; uncommon along the coast of Sarasota County; relatively uncommon in Manatee County; and relatively common along much of the eastern shore of Tampa Bay, Hillsborough County. Based on aerial surveys, he estimated that the total number of Manatees in the United States was 750-850. According to his survey, 350 to 400 occur along the Gulf coast, including approximately 30 in the Tampa Bay area, 35 between Tampa Bay and Charlotte Harbor, and 80 in the Charlotte Harbor area. Thus, according to these figures, about 36-41 percent of the Gulf population and 17-19 percent of the total U. S. population occurs along the coast of the seven-county area.

Irvine and Campbell (1976) conducted an aerial survey of Florida Manatee populations in January-February 1976 and estimated a total of over 700 individuals. Winter population estimates appear to serve as a good estimator of the size of the Manatee population in Florida. In the severe winter of 1977, Manatee mortality was greatly increased throughout the state. Between 1 January and 20 February 1977, 33 carcasses were located (Campbell and Irvine 1977). Additional surveys have been conducted during 1977, but results are not yet available. Hartman (1976) believed that the current population is fairly stable but as the human population increases, there will be a gradual decrease in the Manatee population. He predicted that the incidence of propeller kills, attacks by vandals, and poaching will increase, and dredging operations and pollution may destroy additional Manatee food sources.

Basis for Priority Status: The Manatee is listed as Endangered by the United States Department of the Interior, Threatened by the Florida Game and Fresh Water Fish Commission and the Florida Committee on Rare and

Endangered Plants and Animals, and Vulnerable by the International Union for the Conservation of Nature and Natural Resources.

The following areas within the seven-county area have been designated as Critical Habitat by the U. S. Department of the Interior:

Hillsborough County - Little Manatee River below U. S. Route 301
Manatee County - Manatee River below Lake Manatee
Sarasota County - Myakka River below Myakka River State Park
DeSoto - Charlotte counties - Peace River below State Route 760 bridge
Charlotte County - Charlotte Harbor north of Charlotte-Lee county line.

Potential Impacts of Mining: There would appear to be no reason to assume that direct effects of phosphate mining will have any impact on the current status of the Manatee in the seven-county area. However, accidental slime spills or other secondary effects of mining-related activities that have a harmful effect on vegetation in coastal or freshwater areas inhabited by Manatees could have a detrimental effect on this species. A possible beneficial effect of phosphate industry activities might be the creation of warm water out-flows that provide winter refugia for Manatee aggregations. However, it remains to be seen whether the latter apparently favorable impact outweighs the negative impact of increased coastal pollution associated with such facilities.

Selected References:

*Bertram, G. C. L., and C. K. R. Bertram. 1973. The modern Sirenia: their distribution and status. Biol. J. Linn. Soc. 5: 297-338.

*Campbell, H. W. 1976. The Florida Manatee and related species. Plaster Jacket (Fla. State Mus.) No. 25: 1-10.

*Campbell, H. W., and A. B. Irvine. 1977. Winter of 1977: impact on Florida Manatees. Abs. Tech. Pap. pres. 57th Ann. Meeting Amer. Soc. Mammal., Mich. State Univ., East Lansing, 19-23 June 1977.

Hartman, D. S. 1971. Behavior and ecology of the Florida Manatee, _Trichechus manatus latirostris_ (Harlan), at Crystal River, Citrus County. Ph.D. Thesis, Cornell Univ., Ithaca, New York. 285 pp.

*Hartman, D. S. 1974. Distribution, status, and conservation of the Manatee in the United States. Unpubl. MS. 247 pp.

*Hartman, D. S. 1976. Manatee, Pages 1071-1076 _in_ Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

*Husar, S. L. 1977. The West Indian Manatee (_Trichechus manatus_). U.S. Dept. Int. Fish and Wildl. Serv. Wildl. Res. Rept. 7. 22 pp.

*Irvine, B., and H. W. Campbell. 1976. Aerial counts of West Indian Manatee, _Trichechus manatus_, in Florida. Abs. Tech. Pap. pres. 56th Ann. Meeting Amer. Soc. Mammal., Texas Tech. Univ., Lubbock, Texas, 20-24 June 1976.

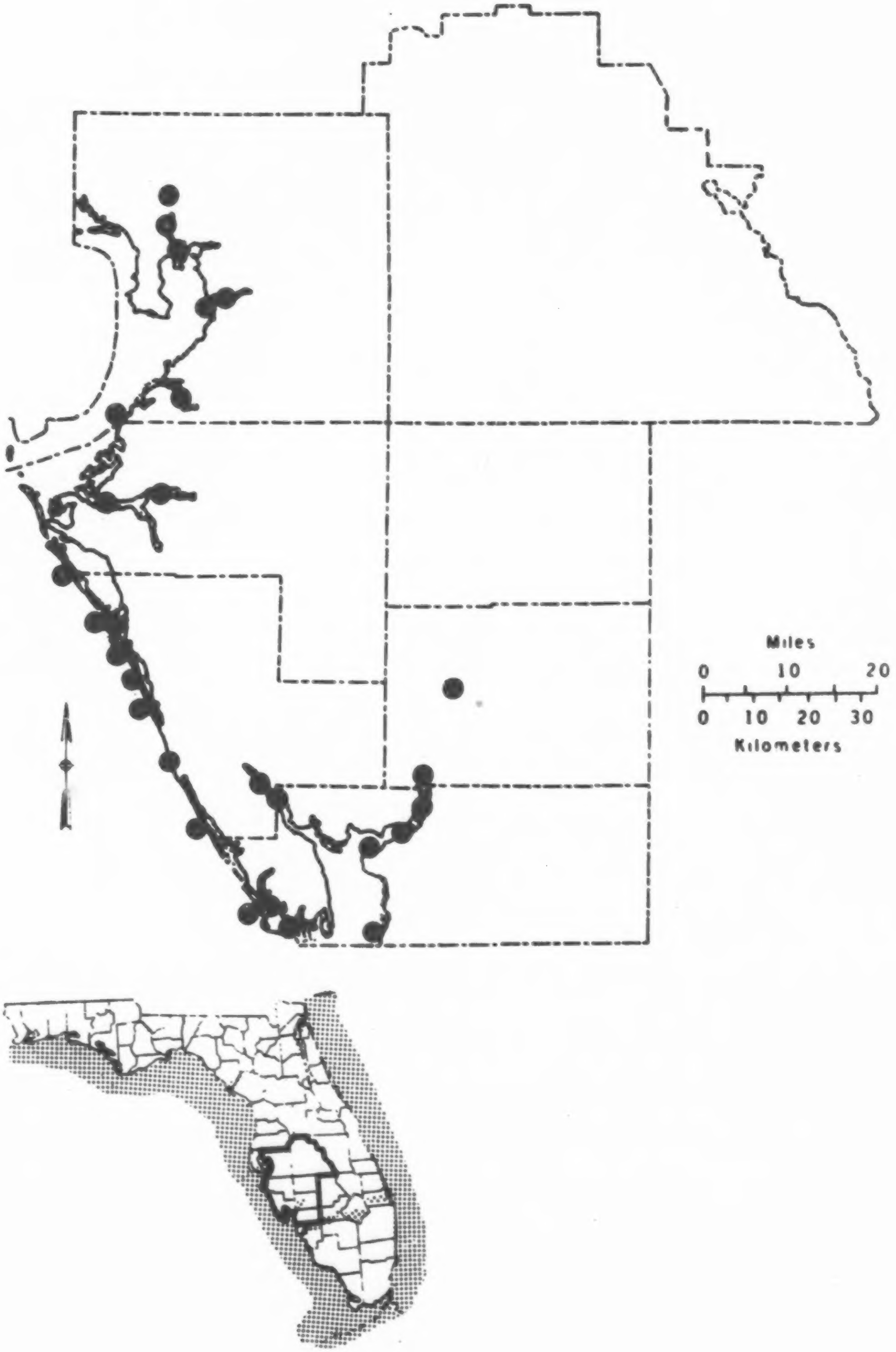
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Fig. VIII.E.34. MANATEE (*Trichechus manatus*)

Game

WILD HOG Sus scrofa Linnaeus

Order Artiodactyla Family Suidae

Other Names: Hog, Feral Pig

Distribution: The Wild Hog occurs throughout the seven-county area, with records for all counties. According to Stevenson (1976), feral individuals exist throughout most or all of mainland Florida. Wild Boar were introduced from Europe into North Carolina and have since spread to other southeastern states (DeVos *et al.* 1956).

Habitat: In south Florida, this species has been recorded in sawgrass marsh with tree islands, flatwoods, hammocks, swamps, and pine uplands (Layne 1974). In the seven-county area, observed habitats include pine flatwoods, cabbage palm and live oak hammocks, mixed hardwood and cypress swamps, freshwater marshes, and grasslands. In a study conducted by Gysel (unpubl. MS.) in Myakka River State Park, foraging activities were most intensive in live oak and cabbage palm hammocks, although areas of marsh associated with live oaks were also used.

Population Status: Wild Hogs are generally common in the more secluded areas within the seven-county area. They have been reported as abundant in the Lower Hillsborough Flood Detention Area (Brown 1974), common in Myakka River State Park (Fla. Dept. Nat. Res. 1976), and rare in Hillsborough River State Park (Stevenson 1967). Gysel (unpubl. MS.) estimated population density on a study plot at Myakka River State Park in 1968 and 1969 as 9-12 hogs per acre. In 1972, the Florida Game and Fresh Water Fish Commission removed 200 hogs from the park because numbers were too high and habitat destruction from rooting was severe (K. C. Alvarez pers. comm.). Belden and Frankenberger

(1976) conducted a mail survey of statewide abundance and distribution of feral hogs and concluded that the most dense populations around the state have decreased or remained approximately stable during the past ten years. Fig. VIII.E.36. shows hog distribution and relative densities in the seven-county area as shown by Belden and Frankenberger (1976).

Basis for Priority Status: The Wild Hog is an important game animal in Florida. Records indicate that for the five seasons 1970-71 through 1974-75, the statewide annual harvest ranged from 36,034 to 84,128 with a mean of 51,200 (Belden and Frankenberger 1976).

Potential Impacts of Mining: Destruction of wetlands and forested areas by mining activities may decrease hog populations in the seven-county area. Unreclaimed mined lands and most types of reclaimed lands would probably not support substantial hog populations.

Selected References:

*Belden, R. C., and W. C. Frankenberger. 1976. Distribution, relative abundance and management needs of feral hogs in Florida. Job Performance Rept. State of Fla. W-41-23. 11 pp.

*Brown, L. N. 1974. Mammalian faunal assessment, Pages 67-80 *in* Cowell, B. C., *et al.*, Biological assessment of the Lower Hillsborough Flood Detention Area for recommendation of ecologically based land management. Univ. of So. Fla., Tampa. 111 pp.

*DeVos, A., R. H. Manville, and R. G. Van Gelder. 1956. Introduced mammals and their influence on native biota. Zoologica 41(4): 163-194.

*Florida Department of Natural Resources. 1976. Vertebrates of Myakka River State Park. 26 pp.

*Gysel, L. W. Description of vegetation communities and animal interrelationships in Myakka River State Park, Florida. Unpubl. MS. Dept. of Fisheries and Wildl., Mich. State Univ. 10 pp.

*Layne, J. N. 1974. The land mammals of south Florida, Pages 386-413 _in_ Gleason, P. J., ed., Environments of south Florida: present and past. Miami Geol. Soc. Memoir 2. 452 pp.

*Stevenson, H. M. 1976. Vertebrates of Florida, identification and distribution. Univ. Presses of Fla., Gainesville. 607 pp.

*Stevenson, J. A. 1967. A list of the vertebrates identified in Hillsborough River State Park. Fla. Brd. of Parks. 16 pp.

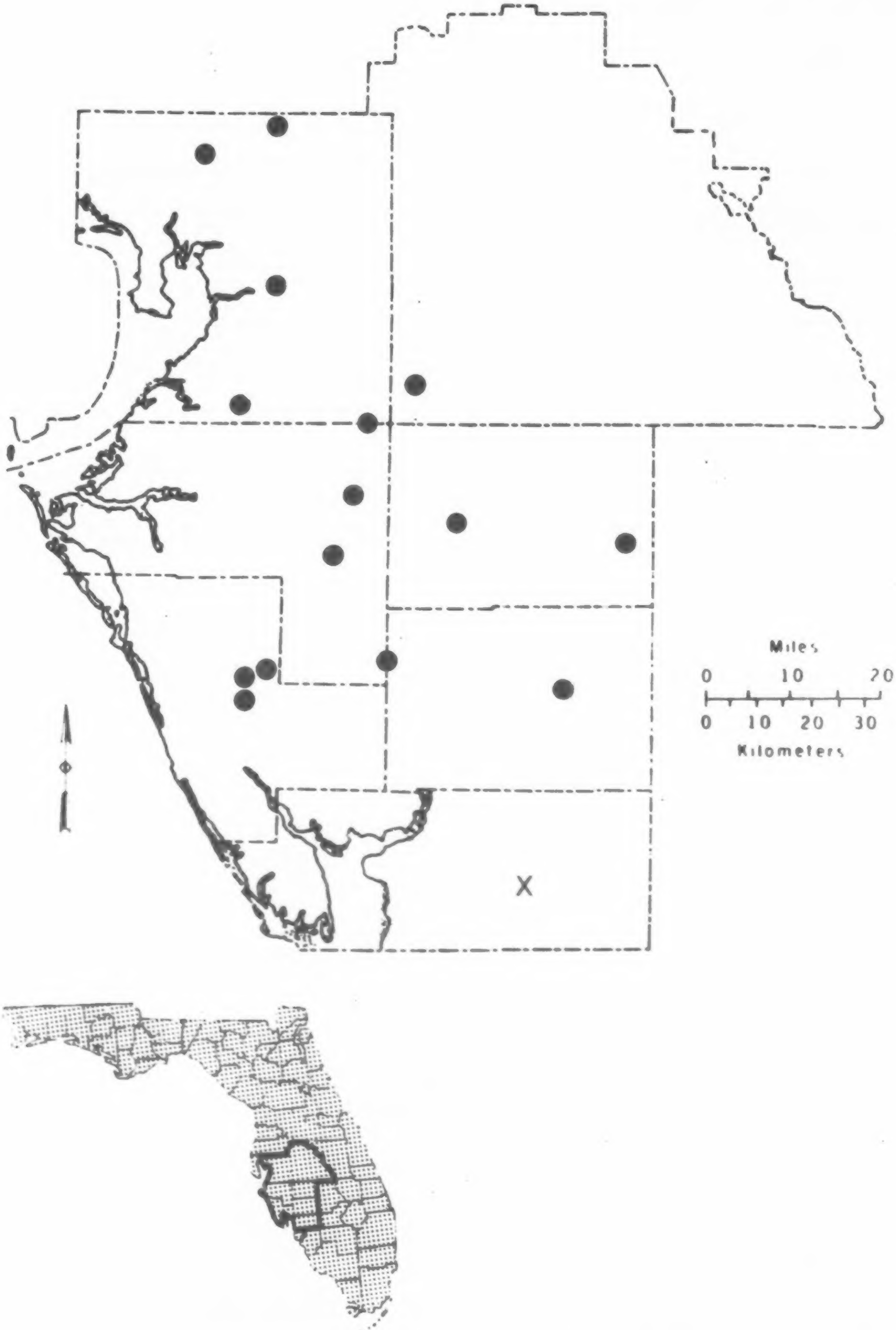
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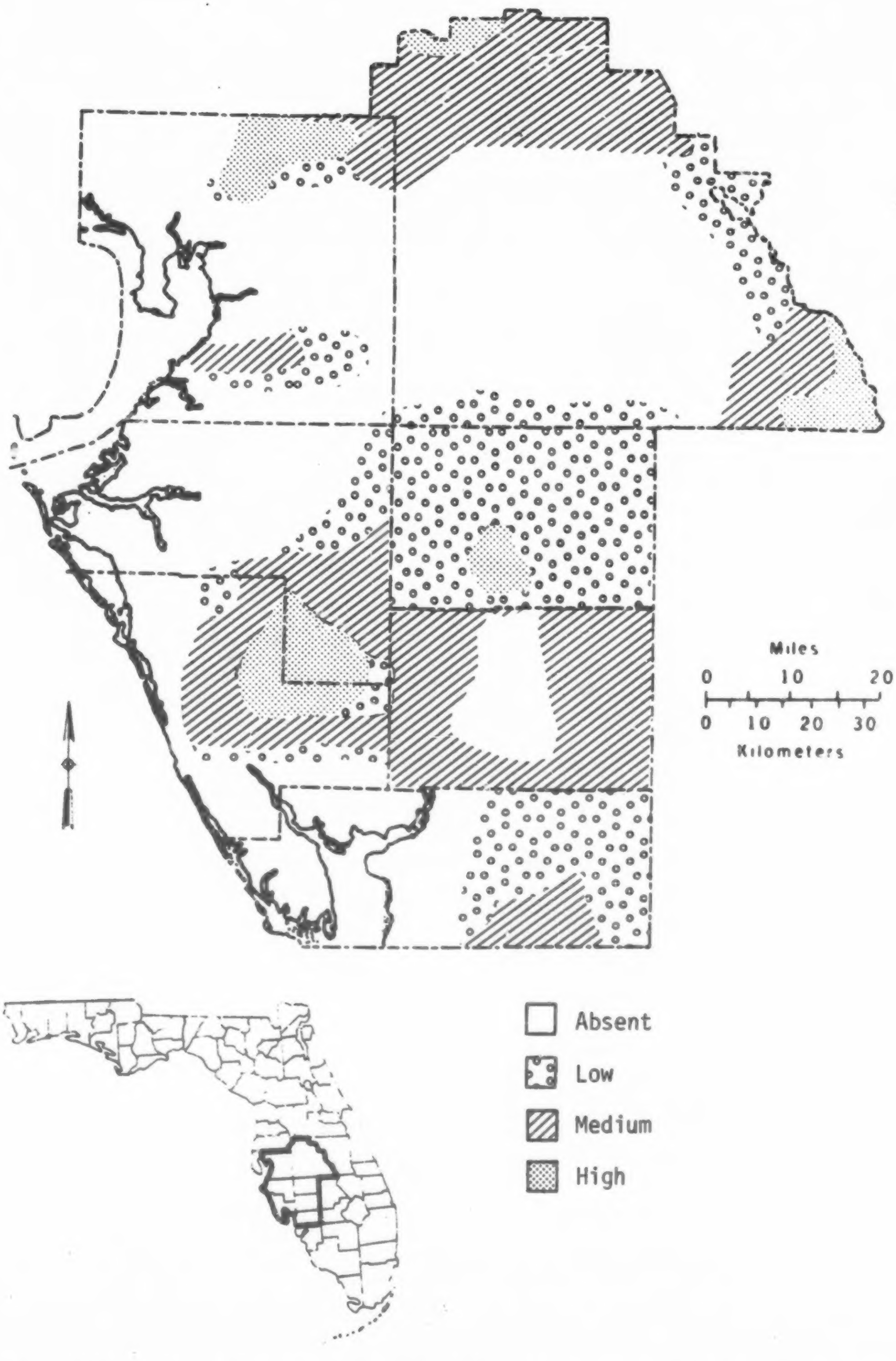
Fig. VIII.E.35. WILD HOG (Sus scrofa)


Miles
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Kilometers
Absent
Low
Medium
High

Fig. VIII.F.36. WILD HOG (Sus scrofa). Relative abundance based on Belden and Frankenberger 1976.

Game

WHITE-TAILED DEER   *Odocoileus virginianus* Zimmerman

Order Artiodactyla   Family Cervidae

Distribution: The White-tailed Deer has been recorded from all counties in the seven-county area. This species is found throughout mainland Florida, with an isolated subspecies (the Key Deer, *O. v. clavium*) on the Big Pine group of the Florida Keys. The White-tail occurs throughout the United States, except the Southwest, into southern Canada, and through all of Mexico, except Baja California, and Central America (Hall and Kelson 1959).

Habitat: Deer utilize many habitats. Layne (1974) mentions occurrence in south Florida in flatwoods, swamps, hammocks, freshwater marshes with tree islands, pinelands, wet prairies, willow heads, grassy areas along beaches, mangroves, and disturbed areas. According to Harlow (1959), three major types of habitat support 85 percent of the total deer population in Florida. These are pine-oak uplands, flatwoods, and hammocks. Approximately 90 percent of the forest land of the South is open to deer hunting (Halls and Stransky 1971). Habitats reported to be utilized by deer in the seven-county area include pine-turkey oak, pine flatwoods, live oak hammocks, cabbage palm hammocks, mesic hammocks, mixed hardwood swamps, bayheads, dry prairies, and improved pastures, freshwater marshes and wet prairies, and old phosphate-mined areas. Seasonal habitat shifts may occur in response to local variations in food supply.

Population Status: The White-tailed Deer is relatively common throughout the seven-county area. Statewide population estimates were determined by Harlow and Jones (1965) for 1964. In the seven-county area deer numbers were estimated to be moderately abundant (2130-2896) in Polk County; moderate (1018-1954) in Charlotte, Hardee, Hillsborough, Manatee, and Sarasota counties; and light (90-879) in DeSoto County. The population of the seven-county area was about 4-8 percent of the total of 164,000 estimated for the entire state. Halls and Stransky (1971) estimated the Florida deer population as 430,000, with the total number killed in 1970 being 42,900. Approximate numbers of deer killed in the seven counties were: Charlotte, 350; DeSoto, 400; Hardee, 300; Hillsborough, 700; Manatee, 400; Polk, 1800; and Sarasota, 300. The combined harvest for the seven-county area was about 10 percent of the total for the state. The deer was reported as common in the Lower Hillsborough Flood Detention Area (Brown 1974) but rare in Hillsborough River State Park (Stevenson 1967). J. B. Funderburg (pers. comm.) considered deer to be rare in the Orange Park phosphate mine area in 1962-66. It is regarded as abundant in all habitats of Myakka River State Park (Fla. Dept. Nat. Res. 1976). Another area of presently high populations is the prairie-cabbage palm hammock country in the southeast portion of DeSoto County.

Basis for Priority Status: The White-tailed Deer is a highly valued game species in Florida.

Potential Impacts of Mining: Mining activities would probably have a detrimental effect on the deer population of the seven-county area through reduction of habitat. Habitats created by reclamation as currently practiced would not support good deer populations. However, through proper management, good deer habitat could probably be developed on reclaimed lands.

Selected References:

*Brown, L. N. 1974. Mammalian faunal assessment, Pages 67-80 in

Cowell, B. C., et al., Biological assessment of the Lower Hillsborough Flood Detention Area for recommendation of ecologically based land management. Univ. of So. Fla., Tampa. 111 pp.

*Florida Department of Natural Resources. 1976. Vertebrates of Myakka River State Park. 16 pp.

*Hall, E. R., and K. R. Kelson. 1959. The mammals of North America. 2 vols. Ronald Press, New York. 1083 pp.

*Halls, L. K., and J. J. Stransky. 1971. Atlas of southern forest game. Southern Forest Experiment Sta., Forest Serv., U. S. Dept. of Agric. 24 pp.

*Harlow, R. F. 1959. An evaluation of White-tailed Deer habitat in Florida. Fla. Game and Fresh Water Fish Comm. Tech. Bull. 5. 64 pp.

*Harlow, R. F., and F. K. Jones, Jr. 1965. Deer herd dynamics and populations, Pages 58-73 in Harlow, R. F., and F. K. Jones, Jr., eds., The White-Tailed Deer in Florida. Fla. Game and Fresh Water Fish Comm., Tech. Bull. No. 9. 240 pp.

*Layne, J. N. 1974. The land mammals of south Florida, Pages 386-413 in Gleason, P. J., ed., Environments of south Florida: present and past. Miami Geol. Soc. Memoir 2. 452 pp.

*Stevenson, J. A. 1967. A list of the vertebrates identified in Hillsborough River State Park. Fla. Brd. of Parks. 16 pp.

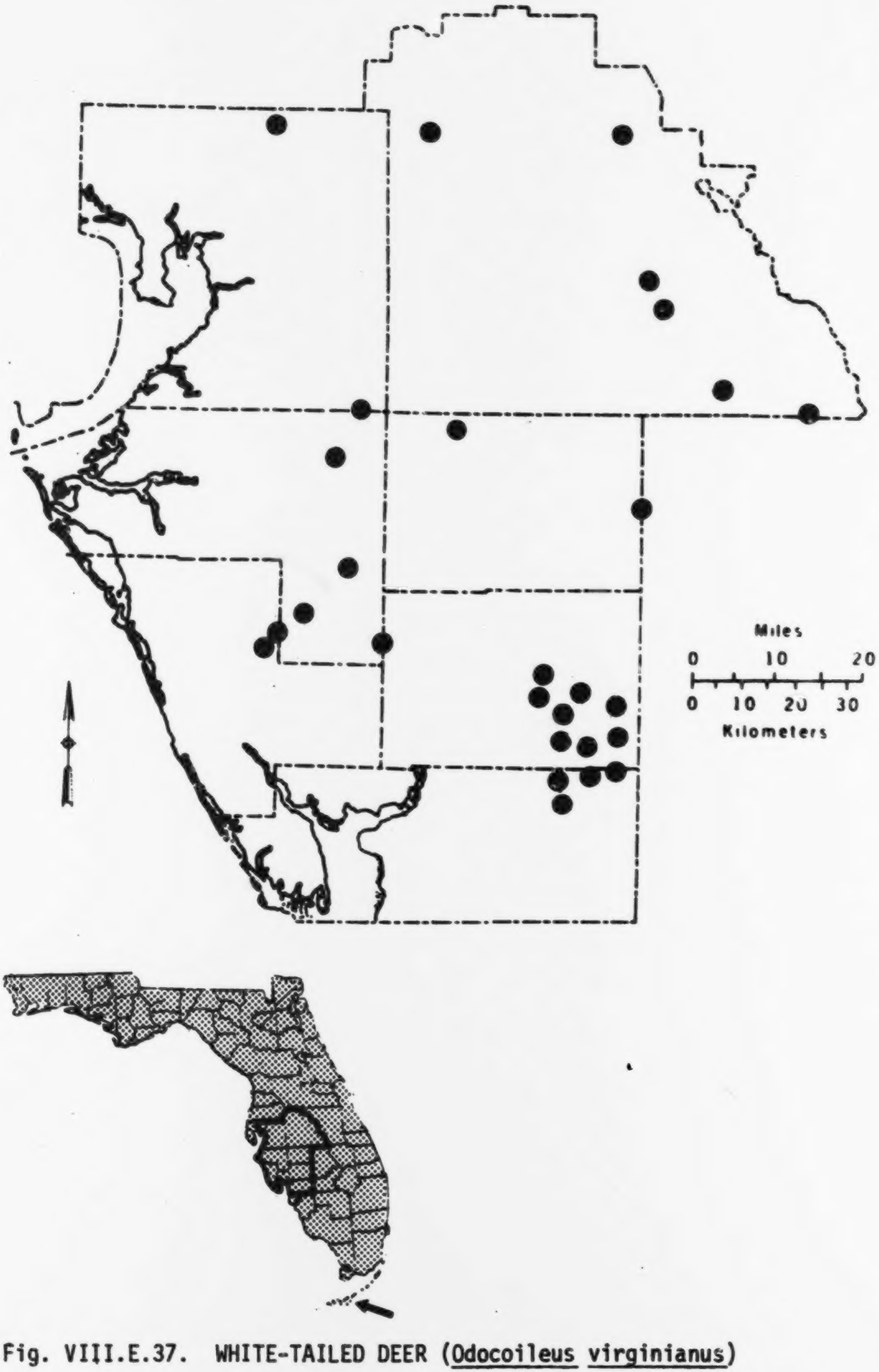
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Fig. VIII.E.37. WHITE-TAILED DEER (_Odocoileus virginianus_)

F. Invertebrates

A comprehensive inventory of invertebrates in the seven-county area equivalent to that of the vertebrate animals was beyond the scope of this project. Weems (1977) pointed out that the obstacles to compiling inventories of invertebrates include: "1) the immense number of species involved, 2) the comparatively small size of most invertebrates, 3) the seasonal occurrence in the adult or readily identifiable life stage, 4) the lack of available data for many species, due in large part to inadequate survey...which, in turn, is due primarily to inadequate funding for surveys of invertebrates in comparison to what has been done for most vertebrates, and 5) the difficulty of identification -- the lack of competent taxonomic specialists in some groups, and underpaid, overworked specialists in others."

This report summarizes the contents of major published and unpublished data sources on invertebrates in the seven-county area (Table VIII.F.1) and singles out 17 priority species for more detailed consideration. This group (Table VIII.F.2) includes ten species listed by the Florida Committee on Rare and Endangered Plants and Animals and seven commercial species included in the Summary of Florida Commercial Marine Landings data for the seven-county area (Div. Mar. Res. 1975). The listed forms include two marine species, the Atlantic Geoduck and the Mangrove Crab, and eight terrestrial species, including one spider and seven beetles. These species are listed because they are restricted to specific habitats which are becoming scarce or are dependent upon certain vertebrate hosts which are themselves threatened. It should be emphasized that the current list of rare and endangered invertebrates prepared by the Florida Committee on Rare and Endangered Plants and Animals is very incomplete and selective, as it covers only certain better-known taxonomic groups. Undoubtedly, many other invertebrate species would meet the criteria for listing if their population status and habitat preferences were known.

Unfortunately, emphasis in faunal surveys in the study area, as elsewhere, has generally been on the vertebrates. However, invertebrates are more habitat-specific and localized in their distributions compared with most vertebrates and hence may be more drastically affected by local habitat changes. Thus many invertebrate groups, especially aquatic forms, are particularly useful indicators of environmental conditions. For example, some mayfly larvae (order Ephemeroptera) are sensitive to water pollution because of its effects on oxygen levels and thus are good bio-indicators of water quality in streams (W. Peters pers. comm.). The larvae of certain dragonflies (order Odonata) may be similarly good indicators of water quality in ponds (M. J. Westfall pers. comm.). William M. Beck, Jr. of the Laboratory of Aquatic Entomology at Florida A & M University prepared a report (Appendix F) for this study, based on unpublished data on midge larvae of the family Chironomidae (order Diptera), in which species are arranged in a five-level classification with regard to their pollution tolerance. The most sensitive forms can tolerate no appreciable organic pollution and thus are excellent indicators of clean water. Beck also analyzes the distribution of 85 species at 98 sampling localities in the Peace River Basin and 48 species at 29 localities in the Alafia River Basin, and provides a list of species classified by relative abundance and habitat type (lotic, lenitic, ubiquitous).

Among the crustaceans, crayfish may serve as indicators of water quality in swamps as well as artificial fresh waters such as canals and ditches (B. C. Cowell pers. comm.). In estuarine as well as freshwater situations, mollusks and other benthic macroinvertebrates are particularly useful and sensitive indicators of environmental stress because of their low mobility and consequent inability to escape adverse conditions (Dames and Moore 1975). Tiffany (n.d.) compiled a list of benthic invertebrates in Sarasota Bay which he concluded were indicator species on the basis of correlations with various parameters relating to water quality.

Invertebrates are also important components of food webs both as primary (herbivores and secondary (carnivores) consumers, and as an important food resource for numerous other species, including man. Species diversity indices and densities of invertebrates may be used as indicators of the stability, nutrient levels, and general quality of the ecosystem of which they are a part.

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Table VIII.F.1. Index to data on invertebrates contained in selected published and unpublished studies in the seven-county area.

Abbreviations

Study Site (county)
C - Charlotte
D - DeSoto
H - Hardee
Hi- Hillsborough
M - Manatee
P - Polk
S - Sarasota
E - entire seven-county area

Subjects
H - Habitat
D - Distribution/locality
A - Abundance
B - Biology/life history
S - Significance as biological indicators
I - Impacts (potential)

Taxa included[1]
Pr - Protozoa (flagellates, amoebas, ciliates)
Po - Porifera (sponges)
Co - Coelenterata (hydrozoans, jellyfishes, sea anemones, corals)
Pl - Platyhelminthes (flatworms, flukes, tapeworms)
N - Nemertina (proboscis worms)
As - Aschelminthes (rotifers, round worms)
Ect- Ectoprocta (bryozoans)
B - Brachiopoda (lamp shells)
M - Mollusca (chitons, snails, tusk shells, bivalves, squid, octopuses)
S - Sipunculida (sipunculid worms)
An - Annelida (tubeworms, earthworms, leeches)
Arthropoda
  Ar - Arachnida (spiders, mites, scorpions)
  Cr - Crustacea (crayfish, lobsters, crabs, shrimp, barnacles)
  I - Insecta (mayflies, dragonflies, grasshoppers, bugs, beetles, bees, flies, butterflies)
Ech- Echinodermata (sea lilies, starfishes, brittle stars, sea urchins, sand dollars, sea cucumbers)

[1]source of classification: Keeton, W. T. 1967. Biological science. W. W. Norton and Co., Inc. New York. 955 pp.

Source	Study Site	Subject	Taxa
Beck 1977	C,D,H,Hi,P	H,D,A,S	I-Diptera (Chironomidae)
Berner 1950	E	H,D,B,S	I-Ephemeroptera
BioIndustries Devel. 1974	S	H	Po,Co,M,Cr,Ech
Borden Phosphate 1975	P	H,D,A,I,	As,M,An,Cr,I

Table VIII.F.1. continued

Source	Study Site	Subject	Taxa
Byers 1930	E	H,D,A,S	I-Odonata
Collard and D'Asaro 1973	C,Hi,M,S	H,D,A,S,I	Pr,Po,Co,Pl,As,Ect B,M,An,Cr,Ech
Conserv. Consult. 1975	Hi,M	H,D,A	Pr,Co,Pl,As,B,M, An,Ar,Cr,I,Ech
Cowell 1974	Hi	H,D,A,S,I	Co,Pl,As,M.An, Cr,I
Cowell _et al_. 1975	H	H,D,A,S,I	As,M,An,Cr,I
Dames and Moore 1975	Hi,M	H,D,A,S	Pl,As,M,An,Cr,I
Dekle 1965	E	H,D	I-Homoptera (Coccidae)
Dept. Env. Reg. (a)	C,D,S	H,D,S	Pl,N,M,An,Cr,I
Dept. Env. Reg. (b)	C,D,H,Hi,M,P,S	H,D	Co,Pl,N,As,M,An, Ar,Cr,I,Ech
Div. Mar. Res. 1975	C,Hi,M,S	D,A,S	M,Cr
Dragovich and Kelly 1964	Hi,M	H,D,A	Po,M,S,An,Cr,Ech
Galtsoff 1954	C,Hi,M,S	H,D,A,S,I	Pr,Po,Co,Pl,N,As, Ect,B,M,S,An,Cr, I,Ech
Gen. Devel. Corp. 1974	S	H,D	M,Cr,I
Godcharles 1971	Hi,M	H,D,A,I	Pl,N,B,M,S,An,Cr
Godcharles and Jaap 1973	C,Hi,M,S	H,D	Co,N,Ect,B,M,S,An, Cr,Ech
Hobbs 1942	E	H,D,A,B	Cr-Decapoda (Cambaridae)
Hopkins 1973	C,Hi,M,S	H,D,A	Pr,Co,As,M,An,Cr, Ech
Johnson and Westfall 1970	E	H,D	I-Odonata (Zygoptera)

Table VIII.F.1. continued

Source	Study Site	Subject	Taxa
Johnson 1972	E	H,D	M-Pelecypoda (Unionidae)
Kimball 1965	E	H,D	I-Lepidoptera
Lanquist 1953	D,H,P	H,D,A,S,I	Po,Co,Pl,N,M,An, Cr,I
Lincer 1975	S	D,H,A,S	M,An,Cr,Ech
McCrone and Stone 1965	E	H,D,B	Ar-Araneae (Theridiidae)
McNulty et al. 1972	C,Hi,M,S	H,D	M
Miss. Chem. Corp. 1976	H	A	As,M,An,Cr,I
Morris and Miller 1977	C,Hi,M,S	H,I	M,Cr
Muma 1955	E	D,H,A	I-Coleoptera (Coccinellidae)
Muma 1967	E	D,H,A	Ar
Muma and Denmark 1970	E	H,D	Ar-Acarina (Phytoseiidae)
Paulson 1966	C,D,H,Hi,M,P,S	H,D,A	I-Odonata (Anisoptera)
Simon 1974	Hi,M	H	M, An,Cr
Spencer and Stegmaier 1973	E	H,D,A	I-Diptera (Agromyzidae)
Taylor 1974	C	H	M,Cr
Taylor et al. 1971	Hi	H,I	M
Thompson 1968	E	H,D,S	M
Tiffany n.d.	S	H,D,A,S	Po,Co,Ect,M,S, An,Cr,Ech
Upchurch et al. 1976	Hi,M	H,D,A,I	Po,Co,Pl,M,An, Cr,Ech

Table VIII.F.1. concluded

Source	Study Site	Subject	Taxa
Ware and Fish 1969	C,D,H,P	H,D,A,I	M,An,Cr,I
Woodruff 1973	E	H,D,A,B	I-Coleoptera (Scarabaeidae)
Young 1954	E	H,D,A	I-Coleoptera

Table VIII.F.2. List of priority invertebrates known or believed to occur in the seven-county area, including species listed by the Florida Committee on Rare and Endangered Plants and Animals and commercial marine species listed by the Division of Marine Resources of the Florida Department of Natural Resources.

Common Name	Scientific Name	Status	Page
Listed			
ATLANTIC GEODUCK	Panopea bitruncata	Rare	1245
MANGROVE CRAB	Aratus pisonii	Threatened	1247
ABOTT'S PURSE-WEB SPIDER	Atypus abotti	Special Concern	1249
GOPHER TORTOISE COPRIS BEETLE	Copris gopheri	Threatened	1250
SCARAB BEETLE	Copris howdeni	Status Undetermined	1251
PENINSULAR GOPHER TORTOISE DUNG BEETLE	Onthophagus polyphemi polyphemi	Threatened	1252
SCARAB BEETLE	Aphodius aegrotus	Status Undetermined	1254
GOPHER TORTOISE APHODIUS BEETLE	Aphodius troglodytes	Threatened	1255
SCARAB BEETLE	Peltotrupes profundus	Status Undetermined	1256
SOUTHWEST FLORIDA WINGLESS BURROWING BEETLE	Mycotrupes pedester	Threatened	1257
Commercial			
BLUE CRAB	Callinectes sapidus		1259
STONE CRAB	Menippe mercenaria		1261
PINK SHRIMP	Penaeus duorarum		1263
BROWN SHRIMP	Penaeus aztecus		1263
WHITE SHRIMP	Penaeus setiferus		1263
ROCK SHRIMP	Sicyonia spp.		1263
SQUID	Loligo plei		1266

Listed - Rare

ATLANTIC GEODUCK — *Panopea bitruncata* (Conrad)

Class Bivalvia — Family Hiatellidae

Other Names: Other scientific names that have been used for this species include *Glycimeris bitruncata* and *Panope bitruncata*.

Distribution: In Florida, living specimens of this clam are known only from Duval, St. Johns, and possibly Gulf counties (Lyons 1976). Its inclusion as a priority species is based on the fact that dead shells have been found along Florida's west coast. Along the coast of the seven-county area, shells of unknown age have been found in Hillsborough, Sarasota, and Charlotte counties (Robertson 1963). The Gulf coast of Florida, south to Monroe County, and the Atlantic coast, south to Indian River County, are included in Robertson's (1963) "suggested range," based on shell collections. Living or freshly dead specimens have been found in scattered localities from North Carolina to the southern tip of Texas (Lyons 1976).

Habitat: This clam occurs in muddy substrates at depths ranging from intertidal to 48 m. The few known Florida specimens were collected from mud in very shallow water near inlets, but Robertson (1963) speculated that the species may be more successful offshore.

Population Status: The Atlantic Geoduck is very rare, if it exists at all, in the seven-county area.

Basis for Priority Status: This species is listed as Rare by the Florida Committee on Rare and Endangered Plants and Animals. Virtually nothing is known of its life history, and the few Florida specimens all were collected in estuarine environments, a habitat-type threatened by pollution, development, dredging and filling operations, and other forms of disturbance.

Potential Impacts of Mining: Considering its rarity in the seven-county area, this species probably would not be affected by phosphate mining activities. However, any estuarine populations of this clam that may exist in the study area would be subject to any adverse affects on estuaries resulting from activities associated indirectly with mining.

Selected References:

*Lyons, W. G. 1976. Atlantic Geoduck, in Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

*Robertson, R. 1963. Bathymetric and geographic distribution of *Panopea bitruncata*. Nautilus 76(3): 75-82.

Listed - Threatened

MANGROVE CRAB — *Aratus pisonii* (H. Milne Edwards)

Order Decapoda — Family Grapsidae

Other Names: Mangrove Tree Crab, Soldier Crab, Shield-back Crab

Distribution: This crab occurs along the coast of southern Florida from Tampa Bay on the west coast to Indian River County on the east coast. It also is known from the Florida Keys, the Antilles, and Brazil, and from Nicaragua to Peru on the eastern Pacific coast (Gore 1976).

Habitat: The Mangrove Crab is restricted almost entirely to mangrove areas along estuarine to nearly fresh water shorelines. It is more characteristic among the roots and branches of red mangroves (*Rhizophora mangle*) than among other mangrove species. Occasionally it may be found on wharves and pier pilings in estuarine and marine areas (Gore 1976).

Population Status: Although no data are available on its abundance, this crab is highly localized in its distribution because of its habitat restriction. Thus, the total number depends on the status of local populations.

Basis for Priority Status: The Mangrove Crab is listed as Threatened by the Florida Committee on Rare and Endangered Plants and Animals on the basis of its restriction to mangroves, which are continually being jeopardized by coastal development.

Potential Impacts of Mining: Phosphate mining will not directly affect this species except where activities associated with mining or transport of phosphate products result in destruction or disturbance of mangrove areas and pollution of adjacent waters.

Selected References:

*Gore, R. H. 1976. Mangrove Crab, in Inventory of rare and endangered biota of Florida (Interim microfiche edition). Fla. Aud. Soc. and Fla. Defenders of the Environment. 1136 pp.

Listed - Species of Special Concern

ABOTT'S PURSE-WEB SPIDER — *Atypus abotti* (Walckenaer)

Order Araneida — Family Atypidae

Atypus abotti inhabits mesic woods from central peninsular Florida westward to Gadsden County and northward into Georgia (Wallace unpubl. MS). No data are available on population status. This species is listed by the Florida Committee on Rare and Endangered Plants and Animals as a Species of Special Concern because of its need for undisturbed mesic hardwood habitat. Its status in the seven-county area is unknown but it is included here because of its probable occurrence on a geographic basis and the presence of suitable habitats.

Selected References:

*Wallace, H. K. Purse-web Spider. Unpubl. MS in files of Fla. Comm. on Rare and End. Plants and Animals.

Listed - Threatened

GOPHER TORTOISE COPRIS BEETLE — *Copris gopheri* Hubbard

Order Coleoptera — Family Scarabaeidae

Distribution: Although no actual records of this species exist from the seven-county area, its range is probably coextensive with that of the Gopher Tortoise (*Gopherus polyphemus*) (Woodruff 1973), which occurs throughout the seven-county area. There are records from nearby Pinellas and Highlands counties. This beetle has not been reported outside of Florida (Woodruff 1973).

Habitat: The Gopher Tortoise Copris Beetle is an obligate associate of Gopher Tortoise burrows found in sandhills vegetation, where it lays its eggs in balls of gopher dung.

Population Status: No data are available on populations of this species in the seven-county area. Hubbard (1894) found specimens common to abundant in every gopher burrow examined in Pinellas County. Woodruff (1973) examined several gopher burrows at Gainesville, but found none of this species present.

Basis for Priority Status: This species is listed as Threatened by the Florida Committee on Rare and Endangered Plants and Animals because of its obligate association with the Gopher Tortoise, which is also considered as Threatened due to extensive habitat modification.

Potential Impacts of Mining: Any mining activities which disturb sandhills and other habitats and will adversely affect Gopher Tortoise populations will likewise reduce populations of the Gopher Tortoise Copris Beetle.

Selected References:

*Hubbard, H. G. 1894. The insect guests of the Florida land tortoise. Insect Life 6(4): 302-315.

*Woodruff, R. E. 1973. The scarab beetles of Florida. Arthropods of of Florida and neighboring land areas. Vol. 8: 56-57.

Listed - Status Undetermined

SCARAB BEETLE *Copris howdeni* Matthews and Halffter

Order Coleoptera Family Scarabaeidae

Distribution: This species is known from only two localities, both of which lie within the seven-county area, in Polk and Manatee counties (Woodruff 1973).

Habitat: The single available habitat description is that of the type locality at Oneco, Manatee County, which was at the rear of an ornamental nursery, containing a pond and bordered by a fairly dense hammock (Woodruff 1973).

Population Status: According to Woodruff (1973), this beetle is either very rare or occupies a very restricted niche, possibly in association with some vertebrate. Only five specimens are known.

Basis for Priority Status: The Florida Committee on Rare and Endangered Plants and Animals lists this species as Status Undetermined. Too little is known about the distribution, preferred habitat, and population size of this beetle to further classify it at this time. The extreme rarity of known specimens is the basis for its priority status.

Potential Impacts of Mining: The possible effects of phosphate mining on *Copris howdeni* are unknown because of lack of knowledge of the distribution, habitats, and abundance of this species in the seven-county area.

Selected References:

*Woodruff, R. E. 1973. The scarab beetles of Florida. Arthropods of Florida and neighboring land areas. Vol. 8: 57.

Listed - Threatened

PENINSULAR GOPHER TORTOISE DUNG BEETLE
Order Coleoptera

Onthophagus polyphemi polyphemi Hubbard
Family Scarabaeidae

Distribution: Within the seven-county area, this subspecies is known from a single locality in Hillsborough County. The species occurs throughout the state north and west to Leon County and south to Dade County (Woodruff 1973), following the distribution pattern of the Gopher Tortoise, with which it is associated.

Habitat: This beetle is an obligate inhabitant of Gopher Tortoise burrows, and it feeds on tortoise dung inside the burrow. Its habitats thus are the same as those of the Gopher Tortoise - generally dry, well-drained areas such as sandhills, scrub, and certain types of flatwoods.

Population Status: Although the species may be abundant within individual burrows, the population is limited by the number of inhabitable burrows available. Because specimens can only be collected by excavation of burrows, a time-consuming process which results in the destruction of the burrow, no reliable estimate of the population status of this beetle is available.

Basis for Priority Status: The Peninsular Gopher Tortoise Dung Beetle is classified as Threatened by the Florida Committee on Rare and Endangered Plants and Animals because of its obligate association with the Gopher Tortoise, which is also listed as Threatened. Destruction of habitat is the major factor responsible for the decline of these closely associated species.

Potential Impacts of Mining: Any mining activities resulting in destruction or modification of sandhills vegetation or other habitats used by the Gopher

Tortoise would be detrimental to this insect.

Selected References:

*Woodruff, R. E. 1973. The scarab beetles of Florida. Arthropods of Florida and neighboring land areas. Vol. 8: 72-73.

Listed - Status Undetermined

SCARAB BEETLE *Aphodius aegrotus* Horn

Order Coleoptera Family Scarabaeidae

Distribution: This beetle is known from Hillsborough and Polk counties within the seven-county area. It occurs in the panhandle and peninsular portions of Florida south to Highlands County, generally following the distribution of the Southeastern Pocket Gopher (*Geomys pinetis*), with which it is associated (Woodruff 1973).

Habitat: *Aphodius aegrotus* inhabits the burrows of the pocket gopher, which occurs principally in areas of high pine-turkey oak, sand scrub, and other vegetative associations with well-drained soils.

Population Status: This species is common in burrows (Woodruff 1973) and is therefore possibly common in those parts of Hillsborough, Polk, DeSoto, and Hardee counties inhabited by pocket gophers. However, no specific data on the status of its populations in the seven-county area are available.

Basis for Priority Status: Restricted along with its host to areas of dry soils, this species reaches its southern limit in the seven-county area. It is designated as Status Undetermined by the Florida Committee on Rare and Endangered Plants and Animals.

Potential Impacts of Mining: Mining activities resulting in destruction of *Geomys pinetis* habitat could prove detrimental to this species.

Selected References:

*Woodruff, R. E. 1973. The scarab beetles of Florida. Arthropods of of Florida and neighboring land areas. Vol. 8: 83-84.

Listed - Threatened

GOPHER TORTOISE APHODIUS BEETLE — *Aphodius troglodytes* Hubbard

Order Coleoptera — Family Scarabaeidae

Distribution: Although no records of this species exist for the seven-county area, it has been recorded from nearby Pinellas and Highlands counties, and probably ranges throughout Florida coextensively with the Gopher Tortoise (Woodruff 1973).

Habitat: This species is known only from Gopher Tortoise burrows, which typically occur in sandhills vegetation or other dry soils sites. It is a dung-feeding species and all life stages have been found in burrows.

Population Status: No data are available on the population status of this species anywhere in its range.

Basis for Priority Status: The Gopher Tortoise Aphodius Beetle is classified as Threatened by the Florida Committee on Rare and Endangered Plants and Animals because of its obligate association with the Gopher Tortoise which is also Threatened.

Potential Impacts of Mining: Mining activities resulting in destruction of sandhills vegetation or other habitats occupied by the Gopher Tortoise would be detrimental to this species.

Selected References:

*Woodruff, R. E. 1973. The scarab beetles of Florida. Arthropods of Florida and neighboring land areas. Vol. 8: 100.

Listed - Status Undetermined

SCARAB BEETLE | Peltotrupes profundus Howden

Order Coleoptera | Family Scarabaeidae

Distribution: This species has been reported from Polk and Hillsborough counties in the seven-county area. It is endemic to Florida and occurs south to Martin and Highlands counties and north and west to Columbia and Lafayette counties (Woodruff 1973).

Habitat: Although no habitat data are available from the seven-county area, the species has been reported from sandhills vegetation in Alachua and Highlands counties, and both species of Peltotrupes are known to characteristically inhabit areas of deep sand, such as scrub and sandhills, and have never been collected in areas without either sand pine or turkey oak (Woodruff 1973).

Population Status: Peltotrupes profundus appears to be fairly common in suitable areas, as large numbers have been collected from some localities. Further study is needed to provide an accurate estimate of population levels of this species.

Basis for Priority Status: This species is listed as Status Undetermined by the Florida Committee on Rare and Endangered Plants and Animals on the basis of its limited distribution and habitat specificity.

Potential Impacts of Mining: Mining activities resulting in destruction of sandhills or sand pine scrub habitats could prove detrimental to this species.

Selected References:

*Woodruff, R. E. 1973. The scarab beetles of Florida. Arthropods of Florida and neighboring land areas. Vol. 8: 168-169.

Listed - Threatened

SOUTHWEST FLORIDA WINGLESS BURROWING BEETLE — *Mycotrupes pedester* Howden

Order Coleoptera — Family Scarabaeidae

Distribution: This endemic Florida species has been recorded from DeSoto and Charlotte counties within the seven-county area and is known only from Lee County elsewhere in the state (Woodruff 1973). Additional study is necessary to determine the exact range of this beetle.

Habitat: Within the seven-county area, this species has been recorded only from "scrub islands", areas at the end of a chain of large and small patches of scrub. This habitat type is discontinuous from DeSoto County to Marco Island (Woodruff 1973). In Lee County, this beetle was captured by Woodruff (1973) in a trap placed near a drainage canal at the end of a cow pasture and also in a recently-burned area of south Florida slash pine, scattered live oak, and saw palmetto. Small "push ups" of sand are characteristic indicators of the presence of this beetle.

Population Status: Only 47 specimens of this beetle are known, and the species is much less common than other *Mycotrupes* in Florida (Woodruff 1973).

Basis for Priority Status: The Southwest Florida Wingless Burrowing Beetle is classified as Threatened by the Florida Committee on Rare and Endangered Plants and Animals due to the small number of specimens collected, its apparently very limited distribution, and the scarcity of scrub islands, its characteristic habitat.

Potential Impacts of Mining: Destruction of scrub islands by mining activities would probably be extremely detrimental to this species in the seven-county area.

Selected References:

Howden, H. F. 1955. Biology and taxonomy of North American beetles in the subfamily Geotrupinae with revisions of the genera Bolbocerosoma, Eucanthus, Geotrupes, and Peltotrupes (Scarabaeidae). Proc. U. S. Nat. Mus. 104(3342): 151-319.

*Woodruff, R. E. 1973. The scarab beetles of Florida. Arthropods of Florida and neighboring land areas. Vol. 8: 173-174.

Commercial

BLUE CRAB *Callinectes sapidus* Rathbun

Order Decapoda Family Portunidae

Distribution: The Blue Crab is common along the entire west coast of Florida, and occurs along both the Gulf and east coasts of the United States in shallow water.

Habitat: This species uses different salinity regimes at different times of its life. Females spawn near or in the Gulf and the planktonic larvae settle to the bottom. Post-larval stages move upstream with the saline deep water into the estuaries. Mating occurs in low and medium salinity water, and females return to the Gulf to spawn.

Dragovich and Kelly (1964) report this species to be found throughout Tampa Bay. It is very common in the brackish waters of Old Tampa Bay, but is rarely collected at the mouth of Tampa Bay and adjacent offshore waters.

Utilization: The Division of Marine Resources (1975) reports the following landings in the seven-county area. The total dollar value for the region was $118,488 for 1975. Presumably the bulk of the crabs reported from the four coastal counties were harvested in the general area.

	Charlotte		Hillsborough		Manatee		Sarasota	
	pounds	dollars	pounds	dollars	pounds	dollars	pounds	dollars
Hard	254,045	31,771	440,205	39,912	171,763	26,620	156,296	19,719
Soft	60	79	340	387	-	-	-	-
Total	254,105	31,850	440,545	40,299	171,763	26,620	156,296	19,719

Potential Impacts of Mining: Blue Crabs are potentially more vulnerable to adverse affects of phosphate mining than other marine invertebrates, as they are often found in low salinity water in estuaries and at the mouths of rivers. Therefore, phosphate spills or habitat destruction as a result of phosphate-related activities would be detrimental to Blue Crab populations in the seven-county area.

Selected References:

*Division of Marine Resources. 1975. Summary of Florida commercial marine landings. Fla. Dept. Nat. Res. 32 pp.

*Dragovich, A., and J. A. Kelly, Jr. 1964. Ecological observations of macro-invertebrates in Tampa Bay, Florida 1961-1962. Bull. Mar. Sci. Gulf Carib. 14: 74-102.

Commercial

STONE CRAB *Menippe mercenaria* (Say)

Order Decapoda Family Xanthidae

Distribution: The range of the Stone Crab extends from North Carolina to Mexico, but the North American fishery for this species is exclusive to Florida. Most Stone Crabs harvested commercially in Florida are landed on the west coast.

Utilization: The Division of Marine Resources (1975) reports the following landings for 1975, which resulted in a total monetary value of $30,227:

Charlotte		Hillsborough		Manatee		Sarasota	
pounds	dollars	pounds	dollars	pounds	dollars	pounds	dollars
28,789	24,922	-	-	5662	4660	860	645

Potential Impacts of Mining: Mining and mining-related activities may adversely affect Stone Crabs through pollution and/or dredging of estuarine and coastal waters. As an example of potential problems, the bottom of Hillsborough Bay has a thick layer of muck composed partially of human and industrial wastes. Environmentalists warn that the scheduled dredging of the bay, in connection with a project to deepen and widen the ship channel, will resuspend the finer particles, thus reducing light penetration, as well as unlock poisons and metals that are buried in the sediments (Klein 1977).

Selected References:

*Division of Marine Resources. 1975. Summary of Florida commercial marine landings. Fla. Dept. Nat. Res. 32 pp.

*Klein, G. 1977. Environmentalists disputing bay dredging safety claims. The Tampa Tribune, 5 September: 1A, 4A, 10A.

Savage, T., J. R. Sullivan, and C. E. Kalman. 1975. An analysis of Stone Crab (Menippe mercenaria) landings on Florida's west coast, with a brief synopsis of the fishery. Fla. Mar. Res. Publ. No. 13. 37 pp.

Commercial

PINK SHRIMP	*Penaeus duorarum* Burkenroad
BROWN SHRIMP	*Penaeus aztecus* Ives
WHITE SHRIMP	*Penaeus setiferus* Say
ROCK SHRIMP	*Sicyonia* spp.
Order Decapoda	Family Penaeidae

Distribution: At least five species of *Penaeus* shrimp occur in Florida's marine waters, but only three of them are of significant commercial importance. The Brown and White species of shrimp occur in disjunct populations on both coasts of Florida, while the Pink, or Brown-spotted, Shrimp occurs throughout Florida's marine waters. Six species of Rock Shrimp (*Sicyonia*) also occur in Florida's marine waters, but *S. brevirostris* is the only one which enters commercial catches. The three *Penaeus* species account for the major commercial shrimp (*i.e.* food shrimp) production on the west coast of Florida. The offshore grounds north of the Tortugas to Sanibel Island is the major productive commercial area in Florida. The central west coast area is occasionally of commercial importance, but the catches are erratic and the offshore bottom contour is not conducive to large scale trawling. The catch consists primarily of small shrimp taken as they are leaving the shallow inshore nursery areas. Tampa, Hillsborough County, is an important port for Campeche and Tortugas shrimp boats, which occasionally fish in the central west coast area. The best shrimp catches usually occur in spring (Joyce and Eldred 1966).

In addition to its use in the commercial seafood industry, the Pink Shrimp is used as live bait for sports fishing. The shallow inshore waters from Sarasota County to Tarpon Springs (Pinellas County) serve as nursery areas and are the center of the bait shrimp industry.

Habitat: The Penaeus shrimp are detritus feeders tolerant of wide ranges in salinity. The Pink Shrimp, which accounts for the majority of both commercial and bait industries on the west coast of Florida, is found almost exclusively in shallow areas with mud or clay bottoms covered with sea grasses, primarily turtle grass (Thalassia testudinum).

Utilization: Some indication of the extent of current utilization of shrimp in the seven-county area is given by 1975 landing data (Division of Marine Resources 1975). The combined dollar value for all counties is $2,123,629. The majority of the shrimp labelled "Central West Coast" were caught in Gulf waters between Tampa Bay and Charlotte Harbor, inclusive (Nat. Mar. Fish Serv. 1976).

Common Name	Charlotte		Hillsborough		Manatee		Sarasota	
	pounds	dollars	pounds	dollars	pounds	dollars	pounds	dollars
Central West Coast Shrimp	106	126	1,437,299	1,570,202	77,777	100,110	-	-
Bait Shrimp	4695	5712	-	-	43,679	48,918	-	-
Rock Shrimp	4667	2634	807,140	387,455	-	-	-	-
Total	9468	8472	2,244,439	1,957,657	121,456	149,028	0	0

Potential Impacts of Mining: The only conceivable adverse effects of mining activities on shrimp populations in the seven-county area would be through pollution of coastal waters or destruction of sea grass beds through major spills reaching coastal areas, phosphate processing plants located along the coast, or channel dredging or other activities associated with increased shipping of phosphate or phosphate industry-related products.

Selected References:

*Division of Marine Resources. 1975. Summary of Florida commercial marine landings 1975. Fla. Dept. Nat. Res. 32 pp.

*Joyce, E. A., Jr., and B. Eldred. 1966. The Florida shrimping industry. Fla. St. Brd. Cons. Educ. Serv. No. 15. 47 pp.

*National Marine Fisheries Service. 1976. Gulf coast shrimp data, annual summary 1975. Current Fisheries Statistics No. 6925.

Woodburn, K. D., B. Eldred, E. Clark, R. F. Hutton, and R. M. Ingle. 1957. The live bait shrimp industry of the west coast of Florida (Cedar Key to Naples). Fla. St. Brd. Cons. Mar. Lab. Tech. Ser. No. 21. 33 pp.

Commercial

SQUID | *Loligo plei* Lesueur

Order Teuthoidea | Family Loliginidae

Distribution: This species of squid ranges from New England to Florida in the Atlantic, throughout the Gulf of Mexico, and from Central America to Venezuela.

Utilization: The Division of Marine Resources (1975) reports 1975 landings only for Charlotte and Hillsborough counties, which are given below. Presumably the squid brought into these ports were taken principally in the adjacent coastal waters.

County	Pounds	Dollars
Charlotte	410	71
Hillsborough	249	81
Total	659	152

Potential Impacts of Mining: Pollution of coastal waters or channel dredging associated with increased shipping of phosphate and related products conceivably could adversely affect squid populations along the coast of the seven-county area.

Selected References:

*Division of Marine Resources. 1975. Summary of Florida commercial marine landings. Fla. Dept. Nat. Res. 32 pp.

IX. POTENTIAL IMPACTS OF MINING ON FISH AND WILDLIFE

A. General Considerations

It should be emphasized that phosphate mining is not the only activity in the seven-county area with a potential impact on the natural biota of the region. Continuing population growth and spreading development and expansion of such intensive types of agriculture as cattle production on improved pastures and citrus culture already are putting increasing stress on the natural ecosystems of the seven-county area. Thus, even if no further phosphate mining were to occur in the region, there still would be ample cause for concern about the future of its fish and wildlife resources. A particular acreage of critical wildlife habitat is just as surely destroyed by conversion to an orange grove as when mined. It seems, therefore, that environmental implications of phosphate mining should be considered within the broader framework of all regional influences that may adversely affect the natural ecosystems of the area.

Of particular importance in this connection is the necessity of insuring that measures adopted in phosphate mining or reclamation to minimize adverse impacts on wildlife are not later undone. For example, creation of wetland habitats as part of reclamation would be a major boon to wildlife. However, the value of such wetlands may be short-lived if proper controls are not instituted to prevent them from later being drained for development or agriculture by the companies or subsequent owners of the land. Thus such areas and their relationships to surrounding lands should be given special attention in local and areawide land-use planning and regulation to insure their long-term preservation.

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Impacts of mining and associated activities on the natural biota may be either direct or indirect. Direct effects are the result of actual mining, whereas indirect effects stem from activities associated with or dependent in some way upon mining but not with the actual process itself. Obviously, both kinds of effects must be considered in assessing the impact of mining on fish and wildlife.

The most dramatic direct effect of mining is, of course, the radical destruction of the natural topography, soil structure, drainage pattern, vegetation, and animal life of the area mined, leaving a raw, barren landscape of alternating stacks of overburden and deep pits and vast, diked waste-settling basins. Although not documented, to our knowledge, by actual studies, there is little question that the destruction of a given area by actual mining also creates a certain amount of disruption of wildlife populations in adjacent areas not physically disturbed by the mining. The intensity of the disturbance undoubtedly varies with the species, distance from the mine site, nature of adjoining habitats, and other factors. The disruption of peripheral wildlife populations can result from a general reduction in habitat diversity, an actual effect on adjacent habitats from changes in ground water level, surface runoff, or other conditions caused by operations within the mined area; or disruption can result from disturbance of established social organization of populations or increased inter- or intraspecific competition for resources as the result of immigration of individuals from the mined area into adjacent undisturbed habitats.

The potential direct impacts of mining on the biota of aquatic habitats and associated wetlands beyond the mine site probably have more serious implications than in the case of upland habitats. One of the most obvious of these impacts are accidental slime spills entering rivers or streams from slime-settling basins. The effects of spills may extend over many miles of stream, causing serious damage to aquatic vegetation and animal life and displacing terrestrial wildlife species that depend upon aquatic organisms for food. For example, the 3 December 1971 spill into the Whidden Creek tributary of the Peace River affected over 74 miles of stream and produced over 90 percent fish mortality in most sections of the river (Chapman 1973). Slime spills also reduce the natural filtration capacity of the vegetation and hence reduce water quality as well as impair the water storage capacity of wetlands associated with the stream because of the soil sealant effect of the phosphatic-clay sediments that are deposited (Chapman 1973). Although the majority of slime spills do not reach the estuaries, such an event is always a possibility. However, even when the actual effects of the spill are confined to upstream sections of a stream, the deleterious changes in that area may ultimately have some impact on the estuary. Repeated spills in the same watershed could eventually have the cumulative effect of reducing the upstream storage capacity and nutrient-removal capacity of associated wetlands and filling in the pools and deeper, quieter parts of the river with sediments, resulting in higher than normal amounts of water and nutrients reaching the estuary. The potential effects of phosphate mining on estuaries are considered in greater detail in Appendix B of this report, prepared by J. Morris and J. Miller.

Of perhaps even greater overall significance than occasional slime spills is the alteration of normal hydroperiods in regional watersheds as the result of changes produced by dewatering operations accompanying mining and interception of runoff and natural drainage ways. The area of the central Florida phosphate reserves and mining company holdings is superimposed on the headwaters and numerous tributaries of the major rivers of the region. Most, if not all, of the recent mining proposals submitted involve mining in areas occupied by tributaries of these rivers. The cumulative effect of the modification of a large percentage of the upper drainage areas of the rivers could have significant adverse effects on the biota of the downstream portions of the rivers, associated wetlands, and estuaries by altering the extent of seasonal flooding or the degree of dry season draw-down of water in marshes and swamps, and by changing flow characteristics of streams. Some mining plans speak of such changes in the drainage basins, particularly the reduction of wet season flows ("flood skimming"), as being a benefit because of the lessened possibility of downstream flooding. In actuality, however, such flooding may be essential to maintaining the integrity of the downstream aquatic and wetland ecosystems. As a result of the ever-increasing demands on freshwater sources in the seven-county area and increasing stress on natural wetlands, even a relatively slight reduction in water available to these systems might have a significant adverse impact on their fish and wildlife resources.

In the past, reclamation of mined lands has chiefly involved creation of two general types of land: flat well-drained areas usually used for pasture or citrus groves and gently contoured lands with lakes. The lakes are typically deep and have steeply sloping bottoms with little emergent vegetation around their margins. Although these reclaimed lands do support many wildlife species (D. T. Gilbert 1977, Appendix G), the diversity is usually less than that of natural habitats and there is a greater proportion of generalist species.

There is a tendency in recent reclamation proposals to be more innovative and to give more attention to increasing the wildlife value of reclaimed lands through such measures as creation of shallow zones in artificial lakes to produce marsh areas, leaving islands of natural vegetation unmined to serve as refuges for wildlife during mining and as seed stock for re-establishment of natural types of vegetation on the surrounding land after reclamation, and transplanting native tree species from areas to be mined to reclaimed areas. Although some of these things have been done on a limited scale, to date most remain in the conceptual stage.

Potential indirect effects of phosphate mining on fish and wildlife include habitat loss, disturbance, or effects of pollution associated with numerous and varied sources. These include fertilizer plants that may be built in response to expanded mining production; additional power-line corridors needed to supply electricity to new mines and plants; increased ship traffic and harbor improvements, such as dredging of ship channels, resulting from increased shipping of phosphate products or materials such as sulphur needed in fertilizer manufacture; railroad construction for transport of the beneficiated phosphate product from mine to fertilizer plant; increased highway traffic and road construction in areas of new mines; and new housing, commercial, or industrial development stimulated by the opening of new mines. The effects on natural biota from such sources may be far removed from the actual area of mining.

For example, increased phosphate rock production may precipitate the need for new processing plants along the coast or expansion of existing ones such as the Gardinier, Inc. plant on Tampa Bay just north of the mouth of the Alafia River at Gibsonton. As a result, estuarine wildlife may be adversely affected through destruction of mangroves or salt marsh, elimination of tidal flats, or reduction of biological productivity by contamination from such agents as flourite crusts, gypsum, and acid run-off (Upchurch et al. 1976).

B. Predicted General Faunal Changes as a Result of Mining and Reclamation

At present, the overall impact of phosphate mining and associated activities on the fish and wildlife of the seven-county area can only be addressed in broad terms. Detailed assessment is impossible both because of the lack of adequate data on present wildlife populations and habitats in the region and sufficiently detailed information on the future mining plans for the region. Aspects of mining for which additional knowledge is needed as a basis for more refined predictions of local and area-wide impacts on wildlife include such things as the total land area to be undergoing mining at any given time, the size and location of individual mines, the type of reclamation proposed and the expected rate of reclamation, the sites of new processing plants, and location of new powerline rights-of-way.

Potential impacts of mining on each priority species are discussed in the individual species accounts of this report. In the vast majority of cases, any impacts on the species are likely to be adverse. In general, those species that have the most restricted habitat requirements and are most ecologically sensitive will be affected most severely, while more adaptable species will suffer less and in some cases may even be more abundant in reclaimed habitats than in the original environments. Those species that because of their ecological specializations will be affected most by mining activities, as well as any other type of land-use resulting in loss or degradation of their habitats, are the ones that give the region its particular biological "character."

Assuming that the majority of mineable lands now owned by phosphate companies will ultimately be mined, it seems safe to conclude that the overall effect will be a serious reduction in both diversity and abundance of the wildlife resources of the seven-county area. Added to this predicted effect of mining will be the impact of continuing habitat losses from agricultural expansion and development in the region.

Some of the deleterious impacts of mining could be reduced by modification of current reclamation practices and priorities; however, the net loss of fish and wildlife habitat and populations will still be of major proportion.

An important consideration in planning reclamation practices to enhance fish and wildlife values on reclaimed lands is what type of faunal community should be the goal. One approach is to be satisfied with an abundance of a few adaptable species. The other is to attempt to recreate a combination of habitats that will support a more diverse community that will include as many as possible of those species typical of the region before mining. Emphasis on the latter approach in reclamation would do much to minimize the overall impacts of mining on the fish and wildlife of the seven-county area.

Literature Cited

Chapman, P. 1973. Pollution investigation - Peace River and Whidden Creek, Cities Service Company incident, December 3, 1971. Fla. Game and Fresh Water Fish Comm. 51 pp.

Upchurch, S. B., E. D. Estevez, and R. A. Rea. 1976. The distribution and possible effects of removal of sedimentary contaminants offshore of Gardinier, Inc. in Tampa Bay, Florida. Report submitted to State of Florida, Dept. of Env. Reg. 94 pp.

X. RECOMMENDATIONS

A. Data Needs

Presently available data on fish and wildlife habitats and populations in the seven-county area are not adequate to allow detailed assessment of potential impacts of mining or to provide a sound basis for the development of mining and reclamation practices to minimize such impacts.

Among the specific data needs are areawide surveys of key species designed to provide quantitative information on population levels and habitat relationships and an up-to-date inventory of wildlife habitats of the region to determine the exact locations, extent, and quality of these areas.

This survey should include extensive ground truthing as well as low-level aerial mapping. Existing land use and cover maps of the area are either out-dated or not sufficiently detailed for critical habitat evaluation.

There has been surprisingly little research on fish and wildlife of phosphate-mined lands. Data are needed on species composition and populations on various types of reclaimed lands and on techniques for restoration of fish and wildlife habitat. Particular emphasis should be given to determining economical and effective techniques of re-establishing natural forest habitat types such as hydric hammocks, mesic hammocks, and xeric hammocks, and freshwater marshes. These research needs are spelled out in detail in the accompanying report by D. T. Gilbert of the Florida Game and Fresh Water Fish Commission (Appendix G).

There is considerable evidence based on general observations that some unreclaimed mined areas have unusually high wildlife values, as documented by J. B. Edscorn in Appendix C of this report. A detailed inventory of these lands and surveys of their wildlife populations are needed to evaluate their overall regional significance as fish and wildlife habitats.

B. Mining Methods

A variety of measures should be considered to minimize impacts of mining on the natural biota of the seven-county area.

In terms of their fish and wildlife values and other important environmental functions, wetlands constitute the most important natural habitats in the seven-county area and should be afforded maximum protection from mining. Although it is not practical to preserve smaller, isolated marshlands, bayheads, and swamps during mining, mining should be excluded from all floodplains, including those of smaller streams. In many areas of the study area, small streams bordered by hydric hammocks or swamp forests traverse open pasturelands or pine flatwoods. In such situations the narrow strips of forest provide habitat, nesting sites, escape cover, and travel corridors for species which would otherwise be less common or not occur at all in the adjacent habitats. Disruption of these habitats by mining would not only have a local effect but could have a deleterious impact on downstream wetland and aquatic habitats as well.

Proper measures, such as establishment of adequate buffer zones, should be used in mining on uplands adjacent to floodplains to prevent adverse effects on the wetlands.

Deleterious effects of mining on fish and wildlife resources would be minimized through development of an areawide master mining plan that would provide for an orderly chronological and spatial sequencing of mining designed to maintain the best possible fish and wildlife habitats on unmined and reclaimed lands throughout the period of active mining. Similar sequencing of mining operations in individual mines, which would attempt to preserve as much diversity of habitats on unmined areas until replacement habitat was created on reclaimed areas, would mitigate local impacts on wildlife populations.

The practice of leaving unmined areas of natural habitats interconnected as far as possible with strips of natural vegetation to facilitate dispersal of wildlife should be encouraged. Such areas, depending upon size and the species involved, can serve as refuges for wildlife species during mining and nuclei for redevelopment of natural vegetation types by normal succession in reclamation. Reclamation plans involving substrate types, contours, etc. should be designed to be compatible with this goal. Natural travelways between unmined refuge areas could incorporate strips of unmined floodplain wetlands and buffer zones along highways or other areas that would not normally be mined to reduce interference with actual mining.

C. Reclamation - Habitat Restoration

Based on available evidence, unreclaimed mine lands have valuable potential as fish and wildlife habitats. Presently existing unreclaimed areas with demonstrated or potential wildlife significance should be preserved in their present state and managed for their fish and wildlife values.

Serious consideration also should be given to leaving a certain percentage of newly mined lands unreclaimed and managing them for fish and wildlife. Specific management techniques might involve regulation of water levels in old settling basins to create optimum open water and marsh conditions for waterfowl and wetland species; creation of shallow areas in flooded mine pits to provide better fish habitats; and fertilization, top soil spreading, controlled burning, partial leveling or other measures to encourage development of desirable vegetative cover on the piles of overburden. There seems to be little doubt that such unreclaimed areas would provide fish and wildlife habitat superior to that of normally reclaimed land. The rough topography of such unreclaimed areas would also reduce the chances of their being developed at some time in the future.

Unreclaimed lands set aside as fish and wildlife areas located in an appropriate relationship to residential developments would seemingly increase the attractiveness of the latter.

Much could be accomplished with reclaimed land to enhance its wildlife values. Of particular importance is the creation of shallow marsh or swamp-type wetlands to compensate for the loss of such habitats by mining. Increased attention should be given to re-establishment of various types of natural forests. For example, areas capped with sand tailings would be potential sites for attempts to establish sand pines and some of the other typical species of the scrub association. Certain scrub animals, such as the Gopher Tortoise, could be introduced to such sites if they were unable to reach them independently. Use of claywastes to produce soils with reduced drainage might be utilized to establish pine flatwoods type habitats.

Current county reclamation policies and other regulations would prevent some of these suggested measures to reduce impacts of mining on fish and wildlife and enhance wildlife values of mined lands. Hopefully such ordinances and regulations will be changed to allow such practices when their fish and wildlife and general environmental benefits are realized. Alteration of mining practices to minimize adverse impacts on natural biota and of reclamation procedures to enhance fish and wildlife resources on mined-out lands should be examined in the light of present tax laws. It would seem appropriate that rebates of severance tax monies be allowed for lands left unreclaimed and managed as fish and wildlife refuges and for the creation of wetlands as part of regular reclamation. As a further inducement for the development of mined lands for wildlife values, it would seem appropriate to consider establishing lower valorem tax rates for lands reserved for this purpose.